

*1754. 24. 65*  
**The LADIES Diary:**  
**Woman's ALMANACK,**

**For the YEAR of our LORD, 1754.**  
Being the Second after BISSEXTILE, or LEAP-YEAR.

Containing New Improvements in ARTS and SCIENCES,  
and many Entertaining PARTICULARS;

Adapted for the Use and Diversion of the

**F A I R - S E X** *W. H. 1754*

Being the Fifty-first ALMANACK Publish'd of this Kind.



YE Happy FAIR, whom Sacred Transports fire,  
Accept, propitious, what Your Selves inspire :  
To YOU each MUSE and GRACE indulgent bend,  
And SCIENCE wide it's ample Bounds extends.  
Alike your FORM and WIT resutless charm,  
With LOVE and VIRTUE every Bosom warm.

Printed by A. Wilde, for the Company of STATIONERS, 1754.

# P R E F A C E



THE *LADIES DIARY*, of so many Years Establishment, which has given Birth to a great Number of other useful Productions of the like Kind, certainly claims the Respect of the Mathematical World; not so much perhaps, for what it contains, as for promoting a Taste for Science, and an Inclination to excel in Useful Knowledge.

were indeed to be wish'd that proper Care had been always taken to keep up the Character of a Work of such General Benefit, as to render its Merit and Superiority incontestable. But, when *Objections* may have been made to some late *DIARIES* (the Works of which we shall not here examine into) no Part of the Error, real or imaginary, can be supposed to fall on the Contributor, the Compiler only being answerable for the Error he publishes to the World: And it certainly would be thought a poor Plea for an One to alledge, in his own Defence, that he was deceived and misled by his Contributors---He that takes upon him the Direction of a Work of this Nature, ought not only to be able to distinguish and select out proper Materials, but even to furnish from his own Invention, what may, upon Occasion, be farther necessary: Otherwise he may be justly look'd upon as a presumptuous, unskilful Pilot, who takes the Charge of a Ship, tho' he knows little of Navigation, and is less qualified for that important Trust than the major Part of the Ship's Company.

But, tho' the Conductor only, is accountable for what he publishes; yet, on the other Hand, we have Reason to wish many Correspondents to this *DIARY* would be more careful and exact in their Compositions; which would redound much to their Reputation, and give more frequent Opportunities of obliging them. Of the great Number of Mathematical Problems sent to us, very few are found fit for the Publick: Which we do not impute to a Want of Ability in the Authors, but to a want of Taste, and a Desire of Superiority, by puzzling with Difficulties.

# P R E F A C E

regarding whether they have their Uses, or not. In Order to give some Idea what Kind of Questions we apprehend will be proper and acceptable, we shall here venture to subjoin some General Observations

1. In Problems of all Kinds the Conditions ought to appear plain, and such as might occur in the Application of that particular Branch of Science to which they belong.

2. All Questions, especially *Geometrical Ones*, are more easily made in a plain, elementary Manner, than apply'd to frivolous Speculations, which, tho' in Nature, have no Appearance of Use. Questions, clearly laid down, and demonstrated scientifically, may afterwards, be discover'd to have many important Applications, tho' none of these, at first, occurred; whereas, to see some Truths degraded by a Misapplication, must give Displeasure to Persons of Understanding and Lovers of Science, at the same Time that it furnishes Matter of Ridicule for those of a more common Taste.

3. No Question ought to have Place merely upon Account of its Difficulty, much less for requiring more Pains in tedious Computations, than any Man that knows what to do with his Time, can possibly bestow upon it. Too many Questions of this sort, it must be own'd, have appear'd in this *DIARY*; and we are to be wish'd that such Gentlemen who are emulous of excelling in this Way, would for the future pay a little more Regard to the Time and Patience of their Fellow-Contributors. — Problems in the more difficult Branches of Science, if well chosen, will be far from discountenancing. These furnish a large Field for Invention, and improve the Reasoning Faculties; and, when they admit of elegant Conclusions (and such only are proper to afford a very pleasing Satisfaction to a Mind habituated to the Discovery of Truth. But there is a wide Difference between Questions of this Kind and the Kind we have been speaking of above; in which the former is quite useless, and Labour only necessary. Nothing can authorize our giving Place to such. No Problem (unless it has some particular Application to recommend it) can be esteem'd worthy of a Place, whose Solution is tedious, inelegant, and a Work of Labour only.

4. Having thrown together a few loose Hints with Regard to the proper Position of Mathematical Questions; a few others, in Relation to that Part of the *DIARY* titled the *Oracle*, or *Quærist*, may be here improper.

5. *Speculations* about Religion too often tend to promote *Infidelity*; they have given *Offence*, and are therefore, by no Means, to be admitted.

M. A.

# P R E F A C E

*Metaphysical Queries* commonly mean Nothing ; and neither edify nor divert.

*Political Subjects* are as little to our Purpose as *Metaphysical Ones* ; and seldom admit of a more satisfactory Determination.

But, aboveall, we cannot allow of those Sarcastical, ill-manner'd *Queries* levell'd at the *Fair-Sex*. Nothing can be more improper and unpardonable, in a Work professedly calculated for their Use and honour'd with their Countenance and Encouragement.

Whatever tends to promote useful Knowledge (as far as our narrow Limits will allow) we shall gladly receive : Nor will *Queries* (or other Essays) design'd to excite Mirth and Humor be unacceptable, provided no Personal Scandal is intended, and a due Regard to Decency is preserved.

It is not our Design, in the Rules prescrib'd above, to check the Ardor and Invention of our Contributors, but to turn them upon proper Subjects, and thereby prevent that Chagrin and Discontentment that must naturally arise on being disappointed, in finding their Performances inserted. *Superior Merit*, where-ever we find it, we shall always endeavour to distinguish in a proper Manner ; yet, at the same time, have a due Regard to our less experienced Readers, by constantly furnishing something proportionable to their Understanding, wherein they may have an Opportunity of exercising, and shewing their Abilities. As our Talk is not to write a *Mathematical Treatise*, but a *DIARY* for the *LADIES*, we have hop'd that some Things, that might, in another Place, be thought improper, will escape unsensured *here*. It is our Interest to please every Class of Readers : And our Inclination strongly prompts us to encourage the immature Attempts of rising Genius's. The Timorous may communicate their Thoughts freely to us without any Apprehension, or Danger of being expos'd to the World. And, tho' it is impossible for us to please *All*, we shall industriously avoid giving just Cause of Offence to *Any*.—To see the only Person that ought to be answerable for what is Printed, the First himself to decry and ridicule *It*, must argue an uncommon Degree of Confidence and Ill-nature ; such a Conduct, in a Compiler, is infinitely more reproachable than the Want of Judgment he would endeavour to screen, by being the First to cry, *Stop This*.

MARMADUKE HONOR

St. Martin's, June 16, 1753.

All Correspondents are desired to send their Letters [Post] to Mr. Simpson, at Stationers-Hall, London, before the Beginning of May, otherwise they will be too late to be inserted.



# January hath XXXI Days.

1st Quarter, the 1st, at 7 Afternoon.  
 Moon, the 9th, at 2 Morning.  
 2d Quarter, the 15th, at 6 Afternoon.  
 Moon, the 23d, at 9 Morning.  
 3d Quarter, the 31st, at 2 Afternoon.

Sun enters  
 19th. 12 h. 45 m.  
 Apparent Time.

Circumcision: Or, New-Year's-Day	8	5	3	55	Morn.
	8	5	3	55	0 31
	8	4	3	56	1 35
	8	3	3	57	2 39
Old CHRIST-MASS-DAY	8	2	3	58	3 45
Epiphany: Or, Twelfth-Day	8	1	3	59	4 51
	8	0	4	0	5 53
Lucian	7	59	4	1	6 49
	7	58	4	2	riser
Princess Elizabeth Born	7	57	4	3	6 A 30
	7	56	4	4	7 53
	7	55	4	5	9 10
1 Sunday after Epiphany. Hilary	7	54	4	6	10 26
Oxford and Camb. Term Begins	7	53	4	7	11 43
	7	51	4	9	Morn.
	7	50	4	10	0 58
Old Twelfth-Day	7	49	4	11	2 9
Prisca	7	48	4	12	3 16
	7	46	4	14	4 16
2 Sunday after Epiphany	7	45	4	15	5 12
Agnes. In eight Days of St. Hilary	7	44	4	16	5 59
Vincent [1 Return	7	42	4	18	6 38
Term Begins	7	41	4	19	fets
	7	40	4	20	5 A 49
Conversion of St. PAUL	7	38	4	22	6 59
	7	36	4	24	8 1
3 Sunday after Epiphany	7	35	4	25	9 4
From the Day of St. Hil. in 15 Days	7	33	4	27	10 7
[2 Return	7	31	4	29	11 11
King CHARLES I. Martyr'd	7	30	4	30	Morn.
	7	28	4	32	0 15

L. of D.	Day Inc.	D.breaks	Tw.ends	C.bef.	S.	Sun's Dec.	Stars So.
7	50	0 0	6	0	4 16	23 1	8 A 43
7	57	0 13	5	58	6 2	22 30	8 21
8	7	0 23	5	54	6 6	21 47	7 59
8	19	0 35	6	49	6 11	20 55	7 38
8	32	0 48	5	44	6 16	19 53	7 17
8	4	1 3	5	38	6 22	18 40	6 58

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February hath XXVIII Days.

Full Moon, the 7th, at 1 Afternoon  
 Last Quarter, the 14th, at 5 Morning  
 New Moon the 22d, at 4 Morning

Sun enters ♈  
 18th. 3 h 38 m.  
 Apparent Time.

N	W	SUNDAYS, HOLYDAYS, &c.	Sun rises	Sun sets	Mo len
1	F		7 27	4 33	1
2	S	Purification; or, Candlemas-Day	7 25	4 35	2
3	F	4 Sunday after Epiphany	7 23	4 37	3
4	M	On the morrow of Purif. Blef. Mary	7 21	4 39	4
5	T	Agatha [3 Return	7 20	4 40	5
6	W		7 18	4 42	5
7	T		7 16	4 44	6
8	F		7 15	4 45	6
9	S	In 8 days of the Purif. of Blef. Mary	7 13	4 47	7
10	F	Septuagesima Sunday [4 Return	7 11	4 49	9
11	M		7 9	4 51	10
12	T	Term Ends	7 7	4 53	11
13	W	Old Candlemas-Day	7 5	4 55	Mon
14	T	Valentine	7 3	4 57	1
15	F		7 1	4 59	2
16	S		6 59	5 1	3
17	F	Sexagesima Sunday	6 58	5 2	3
18	M		6 56	5 4	4
19	T		6 54	5 6	5
20	W		6 52	5 8	5
21	T		6 50	5 10	6
22	F		6 48	5 12	6
23	S		6 46	5 14	6
24	F	Quinqua. Shrove-Sund. St. Matthias	6 44	5 16	7
25	M		6 42	5 18	9
26	T	Shrove-Tuesday	6 40	5 20	10
27	W	Ash-Wednesday	6 38	5 22	11
28	T		6 36	5 24	Mon

Days	Length of Day.	Day In- creased.	Day breaks	Twilight ends	Clock bef. Sun	Sun's Declin.	Star Sun
1	9 6	1 22	5 31	6 29	14 12	17 2	6
6	9 24	1 40	5 23	6 37	14 40	15 32	6
11	9 42	1 58	5 15	6 45	14 46	13 57	5
16	10 1	2 17	5 6	6 54	14 35	12 15	5
21	10 20	2 36	4 57	7 3	14 4	10 28	5
26	10 40	2 56	4 48	7 12	13 19	8 37	5

# March hath XXXI Days.

Quarter, the 2d. at 6 Morning  
 Moon, the 8 h. at 11 Afternoon  
 Quarter, the 15 h. at 7 Afternoon  
 Moon, the 23d. at 10 Afternoon  
 Quarter, the 31st. at 5 Afternoon

Sun enters V  
 20th. 4 h. 17 m.  
 Apparent Time.

David, Abp.  
 Chad. Bp.  
 Quadragesima. 1 Sunday in Lent

6	34	5	26	0	12
6	32	5	28	1	13
6	30	5	30	2	12
6	28	5	32	3	5

Princess of Hesse Born

6	26	5	34	3	53
6	24	5	36	4	36
6	22	5	38	5	10

Ember Week

Cyprian

6	20	5	40	5	10
6	18	5	42	6	54
6	16	5	44	8	15

2 Sunday in Lent. Reminiscere

6	14	5	46	9	34
6	12	5	48	10	49
6	10	5	50	11	59

Gregory

6	8	5	52	Morn.	
6	6	5	54	0	59
6	4	5	56	1	54

3 Sunday in Lent. St. Patrick

6	2	5	58	2	41
6	0	6	0	3	20
5	58	6	2	3	52

Princess LOUISA Born

Cuthbert

Benedict

5	56	6	4	4	20
5	54	6	6	4	46
5	52	6	8	5	8

4 Sunday in Lent. Midlent Sunday

Lady Day. Prince Edward Born

5	50	6	10	5	sets
5	48	6	12	7	A 0
5	46	6	14	8	4

5	44	6	16	9	9
5	42	6	18	10	12
5	40	6	20	11	14

5	38	6	22	Morn.	
5	36	6	24	0	31
5	34	6	26	1	3

5 Sunday in Lent

L. of Day	Day inc.	D. breaks	Tw. ends	C. bet	S. Sun's Dec.	7 Stars So.								
10	52	3	8	4	43	7	17	1	45	7 S.	30	1	A	3
11	12	3	28	4	32	7	28	11	38	5	35	1		22
11	32	3	48	4	21	7	39	10	20	3	32	4		7
11	52	4	8	4	11	7	49	8	54	1	36	3		48
12	12	4	28	4	0	8	0	7	25	CN.	19	3		30
12	31	4	47	3	48	8	12	5	52	2	17	3		12

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April hath XXX Days.

Full Moon, the 7th, at 8 Morning  
 Last Quarter, the 14th, at 10 Morn.  
 New Moon, the 22d, at 3 Afternoon  
 First Quarter, the 30th, at 1 Morn.

Sun enters  
 19th. 17h. 22m.  
 Apparent Time.

1			5	53	6	27	
2			5	31	6	29	
3	W		5	29	6	31	
4		St. Ambrose	5	27	6	33	
5	F	Old Lady-Day	5	25	6	35	
6	S	Oxford and Camb. Terms End	5	23	6	37	
7	F	6 Sunday in Lent. Palm-Sunday	5	21	6	39	
8	M		5	19	6	41	
9	T		5	17	6	43	
10	W		5	15	6	45	
11	T	Maundy Thursday	5	13	6	47	
12	F	GOOD-FRIDAY	5	11	6	49	
13	S		5	9	6	51	
14	F	EASTER-DAY	5	7	6	53	
15	M	Easter-Monday	5	5	6	55	
16	T	Easter-Tuesday	5	3	6	57	
17	W		5	1	6	59	
18	T		4	59	7	1	
19	F	Albage.	4	57	7	3	
20	S		4	55	7	5	
21	F	1 Sunday after Easter. Low-Sunday	4	54	7	6	
22	M		4	52	7	8	
23	T	St. GEORGE	4	50	7	10	
24	W	Oxford & Camb. Terms Begin	4	49	7	11	
25	T	St. MARK, Evangelist	4	47	7	13	
26	F	Duke of CUMBERLAND Born	4	45	7	15	
27	S	Victory at Culloden	4	43	7	17	
28	F	2 Sunday after Easter	4	41	7	19	
29	M	From the Day of Easter in 15 Days	4	40	7	20	
30	T	[1 Return]	4	38	7	22	

Days	L. of D.	Day inc.	D. breaks	Tw. ends	C. bef.	S	Sun's Dec.	7 Starts
1	12 55	5 11	3 32	8 28	4 0		4N.38	2 A
6	13 15	5 31	3 20	8 40	2 28		6 32	2 A
11	13 34	5 50	3 5	8 55	1 2		8 24	2 A
16	13 53	6 9	2 53	9 7	0A.16		10 12	1 A
21	14 12	6 28	2 39	9 21	1 25		11 56	1 A
26	14 30	6 26	2 27	9 37	2 23		13 35	1 A



# May hath XXXI Days

54.

the 6th, at 5 Afternoon  
 Quarter, the 14th, at 3 Morning  
 con, the 22d, at 4 Morning  
 Quarter, the 29th, at 7 Morning

Sun. enters II  
 20th. 18 h. 19 m.  
 Apparent Time.

St. Philip and Jacob.	Term Begins	4 36	7 24	1 M 53
Fluven. Crofs		4 34	7 26	2 25
Sunday after Easter		4 32	7 28	2 53
From the Day of Easter in 3 Weeks		4 31	7 29	3 22
[2 Return		4 30	7 30	3 52
		4 28	7 32	4 18
		4 27	7 33	8 A 42
		4 25	7 35	9 42
		4 23	7 37	10 38
		4 22	7 38	11 26
		4 20	7 40	Morn.
Sun. after Easter	Old May-Day	4 19	7 41	0 3
From the Day of Easter in 1 Month		4 17	7 43	0 37
[3 Return		4 15	7 45	1 5
		4 14	7 46	1 30
		4 12	7 48	1 52
		4 11	7 49	2 14
		4 9	7 51	2 37
		4 8	7 52	3 2
Sun. after Easter. Rogat. Sunday		4 6	7 54	3 30
From the Day of Easter in 5 Weeks		4 5	7 55	3 59
[4 Return		4 3	7 57	4 18
		4 2	7 58	9 A 6
Holy Thursday.		4 1	7 59	9 59
P. Fr. Wil. Born.	On the Morrow	4 0	8 0	10 44
	[of the Asc. 5 Ret.	3 59	8 1	11 26
6 Sunday after Easter		3 58	8 2	Morn.
Term Ends		3 57	8 3	0 1
		3 56	8 4	0 29
King Charles II. Restoration		3 55	8 5	0 57
Oxford & Cambridge Terms End		3 54	8 6	1 22

Days	L. of D.	Day inc.	D. breaks	Tw. ends	C. of S.	Sun's Dec.	Stars Sc.
1	14 48	7 4	2 6	9 53	3 8	13 9	0 A 58
6	15 5	7 24	1 51	10 11	3 41	16 36	0 39
11	15 21	7 37	1 29	10 34	3 59	17 56	0 20
16	15 36	7 52	1 6	10 57	4 2	19 10	0 00
21	15 50	8 6	0 30	11 40	3 51	20 14	11 M 41
26	16 3	8 19	NoNight	NoNight	8 26	21 31	11 21

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June hath XXX Days.

Full Moon, the 5th, at 3 Morning.  
 Last Quarter, the 12th, at 9 Aftern.  
 New Moon, the 20th, at 3 Aftern.  
 First Quarter, the 27th, at 11 Morn.

Sun enters 21st 3h. 20m.  
 Apparent Time.

1	S	Whit-Sunday	3	52	8	8	1	41
2	F	Whit-Monday	3	51	8	9	2	20
3	M	Whit-Tuesday	3	50	8	10	2	10
4	T	Whit-Wednesday	3	49	8	11	3	36
5	W	Ember-Week	3	48	8	12	3	26
6	T		3	48	8	12	4	10
7	F		3	47	8	13	10	0
8	S		3	47	8	13	10	55
9	F	Trinity Sunday	3	46	8	14	11	4
10	M	Trinity Monday	3	46	8	14	11	30
11	T	S. Barnabas. On mor. of H. Trin.	3	45	8	15	11	51
12	W	Oxford and Camb. Terms Begin	3	45	8	15		Morn.
13	T	Corpus CHRISTI	3	44	8	16	0	17
14	F	Term Begins	3	44	8	16	0	57
15	S		3	44	8	16	1	0
16	F	1 Sunday after Trinity	3	43	8	17	1	45
17	M	St. Alban. In 8 Days of H. Trin.	3	43	8	17	1	55
18	T	[2 Return	3	43	8	17	2	28
19	W		3	43	8	17	3	8
20	T		3	43	8	17	3	10
21	F		3	43	8	17	3	10
22	S	King GEORGE II. Inaug.	3	43	8	17	9	20
23	F	2 Sunday after Trinity	3	43	8	17	9	50
24	M	St. JOHN Bapt. Midsummer-Day	3	43	8	17	10	20
25	T	From the day of H. Trin. in 15 days	3	43	8	17	10	57
26	W	K. GEORGE II. No. [3 Ret.	3	44	8	16	11	24
27	T		3	44	8	16	11	53
28	F		3	44	8	16		Morn.
29	S	St. PETER. and St. PAUL	3	45	8	15	0	20
30	M	3 Sunday after Trinity	3	45	8	15	0	54

Days L. of Day Day inc.

C. after S. Sun's Dec. 7 Stars Sa

1	35	16	8	32	No real Night	2	43	22	N 16	10 M 6
6	16	24	8	40	but conf. Day-light or Twil.	1	54	22	41	10 35
11	16	30	8	46		0	58	23	6	10 15
16	16	34	8	49		0	bef. 4	23	24	9 55
21	16	35	8	51		1	7	23	29	9 34
26	16	34	Decr. 2		No real Night	2	12	23	24	9 14
					but conf. Day-light or Twil.					

Days

1

6

11

16

21

26

Moon, the 4th, at 1 Afternoon  
 1st Quarter, the 12th, at 2 Afternoon  
 New Moon, the 19th, at Midnight  
 1st Quarter, the 26th, at 4 Afternoon

Sun rises &  
 22d. 14h. 19m  
 Apparent Time.

M	From day of H. Tr. in 3 Weeks. 4 Ret.	3	45	8	14	1	M 30
T	Visit. B. V. Mary. Cambridge Com.	3	45	8	14	2	12
W	Term Ends	3	47	8	13	3	2
T		3	47	8	13	3	rises
F	Old Midsummer-Day	3	48	8	12	8	A 29
S		3	49	8	11	9	1
F	4 Sunday after Trinity	3	50	8	10	9	28
M	Oxford Act	3	50	8	10	9	52
T		3	51	8	9	10	16
W		3	52	8	8	10	38
T		3	53	8	7	11	0
F		3	54	8	6	11	23
S		3	55	8	5	11	40
F	Sunday after Trinity	3	56	8	4		Morn.
M	Swithin	3	57	8	3	0	2
T		3	58	8	2	0	50
W		3	59	8	1	1	4
T		4	0	8	0	2	35
F		4	2	7	58		fers
S	Margaret	4	3	7	57	7	A 5
F	6 Sunday after Trinity	4	4	7	56	8	25
M	Magdalen. 12. Carol. Mat. Born	4	6	7	54	8	5
T		4	7	7	53	9	20
W		4	8	7	52	9	51
T	St. JAMES, Apostle	4	10	7	50	10	22
F	St. Anne, Mother of the Virg. Mary	4	11	7	49	10	51
S		4	13	7	47	11	2
M	7 Sunday after Trinity	4	14	7	46		Morn.
T		4	15	7	44	0	9
W	Dog-Days Begin	4	17	7	43	0	5
		4	18	7	42	1	48

Days	L. of Day	Day dec.	D. breaks	Tw. ends	C. bef.	S. Sun's Dec.	7 Stars So
1	16 29	0 6			3	12 23 N 9	8 M 53
6	16 23	0 12	No real	No real	4	7 22 43	8 33
11	16 15	0 20			4	52 22 9	8 12
16	16 5	0 30	Night.	Night.	5	27 21 20	7 52
21	15 53	0 48			5	10 20 30	7 52
26	15 39	0 54	0 48	11 8	6	57 19 23	7 12

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August hath XXXI Days.

Full Moon, the 3d, at 2 Morning  
 Last Quarter, the 11th, at 6 Morning  
 New Moon, the 18th, at 8 Morning  
 First Quarter, the 24th, at 11 Aftern.

Sun enters  
 22d. 20h. 36m.  
 Apparent Time.

1	T	Lammas Day	4	19	7	41	2	M
2	F		4	21	7	39	3	A
3	S		4	22	7	38	4	M
4	F	Sunday after Trinity	4	24	7	36	7	A
5	M		4	25	7	35	8	M
6	T	Transfiguration	4	27	7	33	8	A
7	W		4	28	7	32	9	M
8	T		4	30	7	30	9	A
9	F		4	32	7	28	9	M
10	S	Laurence	4	34	7	26	10	M
11	F	9 S. after Trinity. Ps. Augusta Born	4	35	7	25	10	A
12	M	Old Lammas-Day	4	37	7	23	11	M
13	T		4	39	7	21	11	A
14	W		4	40	7	20	0	M
15	T	Assump. Virgin Mary	4	42	7	18	1	M
16	F		4	44	7	16	2	M
17	S		4	46	7	14	3	M
18	F	10 Sunday after Trinity	4	47	7	13	4	M
19	M		4	49	7	11	7	A
20	T		4	51	7	9	7	M
21	W		4	53	7	7	8	M
22	T		4	55	7	5	9	M
23	F		4	57	7	3	9	M
24	S	St. Bartholomew, Apostle	4	59	7	1	10	M
25	F	11 Sunday after Trinity	5	1	6	59	10	M
26	M		5	2	6	58	11	M
27	T		5	4	6	56	11	M
28	W	Augustine.	5	6	6	54	0	M
29	T	St. John the Baptist Beheaded	5	8	6	52	1	M
30	F		5	10	6	50	2	M
31	S		5	12	6	48	3	M

Days	L. of D.	Day dec.	D. breaks	Tw. ends	C. bef. S.	Sun's Dec.	7 Stars So.
1	15 22	1 13	1 23	10 36	5 48	18 N. 3	6 M 43
6	15 6	1 29	1 43	10 15	5 22	16 46	6 29
11	14 48	1 45	2 1	9 57	4 43	15 37	6 10
16	14 32	2 3	2 19	9 40	3 51	13 45	5 31
21	14 14	2 21	2 34	9 25	2 45	12 7	5 33
26	13 55	2 40	2 49	9 10	1 26	10 25	5 14



754.

## September hath XXX Days.

Full Moon, the 1st, at 5 Afternoon  
 1st Quarter, the 9th, at 9 Afternoon  
 New Moon, the 16th, at 4 Afternoon  
 2nd Quarter, the 23d, at 9 Morning

Sun enters ☊  
 22d. 16 h. 48 m.  
 Apparent Time.

12 Sunday after Trinity. <i>Giles</i>	5	14	6	46	6	A 29
M LONDON Burnt, in 1666. O. S.	5	16	6	44	6	52
T	5	17	6	43	7	15
W	5	19	6	41	7	38
T	5	21	6	39	8	4
F Dog-Days End	5	23	6	37	8	32
S	5	25	6	35	9	3
13 Sunday after Trinity	5	27	6	33	9	41
M	5	29	6	31	10	35
T	5	31	6	29	11	15
W	5	33	6	27	Morn.	
T	5	35	6	25	0	13
F	5	37	6	23	1	23
S Holy-Rood Day	5	39	6	21	2	37
14 Sunday after Trinity	5	41	6	19	3	56
M	5	43	6	17	lets	
T Lambert	5	45	6	15	6	A 34
W	5	47	6	13	7	6
T Ember Week	5	49	6	11	7	41
F	5	51	6	9	8	20
S St. MATTHEW, Apostle	5	53	6	7	9	5
15 Sunday after Trinity	5	55	6	5	9	56
M	5	57	6	3	10	50
T	5	59	6	1	11	45
W	6	1	5	59	Morn.	
T Cyprian	6	3	5	57	0	43
F	6	5	5	55	1	52
S	6	7	5	53	2	55
16 Sunday after Trinity. St. Michael	6	9	5	51	3	59
M	6	11	5	49	5	5

Days	L. of D.	D. dec.	D. breaks	Tw. ends	C. aft. S.	Sun's Dec.	Stars Sd.
1	13 32	3 3	3 6	8 53	0 20	8 N. 16	4 M. 32
6	13 34	3 21	3 20	8 39	1 56	6 25	4 34
11	12 54	3 41	3 33	8 25	3 36	4 31	4 16
16	12 34	4 1	3 44	8 15	5 22	2 36	3 58
21	12 14	4 21	3 55	8 4	7 5	0 39	3 41
26	11 54	4 41	4 6	7 52	8 48	1 S. 38	3 23

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October hath XXXI Days.

Full Moon, the 1<sup>st</sup>, at 10 Morning  
 Last Quarter, the 9<sup>th</sup>, at 9 Morning  
 New Moon, the 16<sup>th</sup>, at 1 Morning  
 First Quarter, the 22<sup>d</sup>, at 1 Aftern.  
 Full Moon, the 30<sup>th</sup>, at 4 Morning

Sun enters M  
 23d. 0 h. 23 m.  
 Apparent Time.

1	T	Remigius	5	12	5	48	5	48
2	W		6	14	5	46	6	10
3	T		6	16	5	44	6	4
4	F		6	18	5	42	7	1
5	S		6	20	5	40	7	4
6	F	17 Sunday after Trinity	6	22	5	38	8	2
7	M		6	24	5	36	9	1
8	T		6	26	5	34	10	1
9	W	St. Dennis	6	28	5	32	11	1
10	T	Old Mich. Day. Dr. and Camb.	Term	Beg	Mon			
11	F		6	32	5	28	0	2
12	S		6	34	5	26	1	3
13	F	18 Sunday after Trinity	6	36	5	24	2	5
14	M		6	38	5	22	4	1
15	T		6	40	5	20	5	3
16	W		6	42	5	18	6	4
17	T	Etheldred, Virgin.	6	44	5	16	6	4
18	F	St. LUKE, Evangelist	6	46	5	14	7	1
19	S		6	48	5	12	7	5
20	F	19 Sunday after Trinity	6	50	5	10	8	4
21	M	Ursula	6	52	5	8	9	4
22	T	King GEORGE II. Crown'd	6	54	5	6	10	4
23	W		6	56	5	4	11	5
24	T		6	58	5	2	12	5
25	F	Griffin	7	0	5	0	0	5
26	S		7	2	4	58	1	5
27	F	20 Sunday after Trinity	7	4	4	56	2	5
28	M	St. SIMON and St. JUDE	7	6	4	54	4	5
29	T		7	7	4	53	5	5
30	W		7	9	4	51	6	5
31	T		7	11	4	49	7	5

Days	h. of Day.	Day dec	D. breaks	Tw. ends	C. alt.	S. Sun's Dec.	Sun's
1	11 36	4 59	4 18	7 42	10 20	3 S 14	1 M
6	11 16	5 10	4 29	7 31	11 56	5 11	2
11	10 56	5 30	4 39	7 21	13 16	7 6	2
16	10 36	5 59	4 49	7 11	14 25	8 53	2
21	10 17	6 18	4 58	7 1	15 19	10 47	1
26	9 57	6 37	5 7	6 52	15 55	12 32	1

Last Quarter, the 7th, at 8 Afternoon  
 New Moon, the 14th, at 11 Morning  
 First Quarter, the 21st, at 5 Afternoon  
 Full Moon, the 29th, at 9 Afternoon

Sun enters 3  
 21st, 25th, 74 m.  
 Apparent Time.

F	All Saints	7	12	4	48	5	A5
S	Pat. of Orange Born. All Souls	7	14	4	46	6	33
I	21 Sunday after Trinity	7	15	4	45	7	18
M	On the morrow of All Souls, 1 Re	7	17	4	43	8	10
T	Powder Plot	7	19	4	41	9	10
W	Michaelmas Term Begins	7	21	4	39	10	14
T	Prince Henry Frederick Born	7	23	4	37	11	22
F		7	25	4	35	Morn	
S	Lord Mayor's Day at London	7	27	4	33	0	39
F	22 S. aft. Trin. R. GEORGE II. Born	7	27	4	33	1683	
M	Martin	7	30	4	30	3	16
T	On the morrow of St. Martin, 2 Re	7	31	4	29	4	32
W		7	33	4	27	5	53
T		7	35	4	25	5	late
F		7	36	4	24	5	A3
S		7	38	4	22	6	20
F	23 Sunday after Trinity	7	39	4	21	7	20
M	In eight days of St. Martin, 3 Re	7	41	4	20	8	30
T		7	42	4	18	9	33
W	Edmund, King and Martyr	7	45	4	17	10	39
I		7	45	4	15	11	41
T	Cecilia, Old Martinmas-Day	7	47	4	13	Morn	
F	Clement	7	48	4	12	0	46
S	24 Sunday after Trinity.	7	49	4	11	1	49
M	Prince William Henry Born. In 10	7	50	4	10	2	50
T	[days of St. Martin, 4 Re	7	51	4	9	3	50
W		7	52	4	8	4	53
T	Term Ends	7	53	4	7	5	57
F		7	54	4	6	5	rich
S	St. Andrew. Ps. Dow. Wales Born.	7	56	4	4	5	A 8

ys	L. of Day.	Day dec.	D. breaks	Tw. ends	C. aft.	S.	Sun's Dec.	Stars So.						
7	9	36	59	5	16	6	44	16	44	14	S 32	1M 9		
7 Stars	9	18	7	17	5	23	6	37	16	7	16	5	0	49
3 M	9	0	7	35	5	30	6	30	15	42	17	34	0	29
2	8	44	7	50	5	36	6	24	14	54	18	49	0	8
2	8	30	8	5	5	42	6	18	13	46	20	0	11	43
2	8	18	8	17	5	48	6	12	12	48	21	3	11	22

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December hath XXXI Days.

Last Quarter, the 7th, at 5 Morning

New Moon, the 13th, at 11 Aftern.

First Quarter, the 21st, at 2 Afternoon

Full Moon, the 29th, at 1 Afternoon

Sun enters w  
21st. 8 h 18m  
Apparent Time

1	F	Advent Sunday	7	57	4	3	54
2	M		7	58	4	2	6
3	T		7	59	4	1	7
4	W	Barbara.	8	0	4	0	9
5	T		8	1	3	59	10
6	F	Nicholas	8	2	3	58	11
7	S		8	3	3	57	Mon
8	F	2 Sunday in Advent	8	3	3	57	0
9	M		8	4	3	56	2
10	T		8	5	3	55	3
11	W		8	5	3	55	4
12	T		8	6	3	54	5
13	F	Lucy	8	6	3	54	
14	S		8	7	3	53	4
15	F	3 Sunday in Advent.	8	7	3	53	5
16	M	O Sapientia.	8	7	3	53	7
17	T	St. Andrew and Camb. Terms End	8	8	3	52	8
18	W	Ember Week	8	8	3	52	9
19	T		8	8	3	52	10
20	F		8	8	3	52	11
21	S	St. THOMAS. Shortest Day	8	8	3	52	Mon
22	F	4 Sunday in Advent	8	8	3	52	0
23	M		8	8	3	52	1
24	T		8	8	3	52	2
25	W	CHRIST-MASS-DAY.	8	8	3	52	3
26	T	St. STEPHEN	8	7	3	53	4
27	F	St. JOHN, Evangelist	8	7	3	53	5
28	S	Innocents	8	7	3	53	6
29	F	1 Sunday after Christmas	8	6	3	54	7
30	M		8	6	3	54	8
31	T	Sylvester	8	5	3	55	9

Days	L. of D.	D. dec.	D. breaks	Tw. ends	C. aft. S.	Sun's Dec.	7 Stars
1	8 6	8 29	5 54	6 6	10 31	21 S. 27	11 A
6	7 57	8 38	5 57	6 3	8 27	22 34	10 11
11	7 50	8 45	5 58	6 2	6 12	23 4	10 17
16	7 46	8 49	5 59	6 1	3 49	23 22	9 55
21	7 44	8 51	6 0	6 0	1 18	23 29	9 38
26	7 46	Inc. 2	5 59	6 1	1 bef. 13	23 22	9 11



Chronological Notes for the Year 1754.

Golden Number	7	Shrove Tuesday	Feb 26.
Cycle of the Sun	27	Easter Day	Apr. 14.
Epact	6	Whit-Sunday	May 2.
Roman Indiction	2	Trinity-Sunday	May 9.
Dominical Letter	F	Advent Sunday	Nov. 1.

The Eclipses in 1754, calculated by Mr. Ralph Hulse; shewing in what Parts of the Earth They will be visible, &c.

There will happen six Eclipses this Year; but, what is remarkable, not one of them will be visible to any Part of *Great Britain, or Ireland*: At other Places They will be seen according to the following Order.

1. *March 23<sup>d</sup>* at 6 Afternoon, the ☉ is 2 Digits eclips'd on the North Side, vertical to a little Sea, West of *Terra Firma*, Lat. 8° North, Long 90° W. Visible in *North America*.

2. *April 7<sup>th</sup>* at 4 in the Morning the ☾ is eclipsed totally 21 Digits, vertical to the Eastern Borders of *Peru*, Lat. 6° South, Long. 70° West. Visible to all *America*.

3. *April 22<sup>d</sup>* at 10 in the Morning the Sun is 2 Digits eclipsed on the South Side, vertical to the Eastern Parts of *Nigritia in Africa*; Lat. 12° North, Long. 30° East. Visible to the Southern Seas.

4. *Sept. 16<sup>th</sup>* at 1 Afternoon, the ☉ is eclipsed in  $m 23^{\circ}$ , towards the Eastern Ocean, beyond the *Philippine Islands*; Lat. 3° North, Long. 163° East. This Eclipse is, still, less than the former.

5. *Oct. 1<sup>st</sup>* at 6 in the Morning, the Moon is totally eclipsed 21 Digits in  $v 8^{\circ}$ . visible to all *America*, vertical to the Sea West of *Panama*, Lat. 3° North, Long. 90° West.

6. *Oct. 16<sup>th</sup>* at 1 in the Morning, the Sun is eclipsed 2 Digits on the North Side in  $\alpha 22^{\circ}$ , vertical to *Medelzar*, Lat. 8° South, Long. 130° West. Visible within the Arctic Circle.

Ralph Hulse.

As we do not know what Tables Mr. Hulse made use of in these Calculations, we cannot satisfy the Publick in that Particular, nor take upon us to judge of their Exactness, not having made any Calculations of these Eclipses ourselves, as They will be all invisible to us.

B

A Table

A Table for finding the Times of Rising, Southing, and Setting of the principal Fix'd Stars; by shewing how much those Times happen before, or after the Southing of the Seven Stars.

Names of the Stars.	Mag.	Time of Rising		Time of Southing		Time of Setting		Meridian Altitude.
		H	M	H	M	H	M	
The Scorpion's Heart, <i>Antares</i>	1	14	b 52	11	b 17	7	b 42	12 40
Bright Star in the Harp, <i>Lyra</i>	1			9	b 4	never set		77 2
Bright Star in the Eagle, <i>Atair</i>	1	14	b 39	7	b 53	1	b 7	46 42
Bright Star in the Southern } Fifth, <i>Fomalhaut</i>	2	7	b 39	4	b 48	1	b 57	7 39
Bright Star in Aries	2	9	b 49	1	b 40	6	a 29	60 46
Brightest of the Seven Stars	3	8	b 16	00	00	8	a 16	61 48
Bull's Eye, <i>Aldebaran</i>	1	6	b 40	0	a 49	8	a 18	54 28
<i>Capella</i>	1			1	a 25	never set		84 12
Foot of Orion, <i>Rigel</i> .	1	3	b 40	1	a 30	6	a 50	10 0
Middle Star in Orion's Girdle	2	4	b 6	1	a 51	7	a 48	37 6
Bright Star in Orion's Shoul- } der, <i>Betelgeuse</i>	1	4	32	2	a 9	8	a 50	45 49
Great Dog Star, <i>Sirius</i>	1	1	b 36	3	a 1	7	a 38	22 8
<i>Castor</i> } in the Twins	1	5	b 55	3	a 44	13	a 23	67 4
<i>Pollux</i> }	2	5	b 2	3	a 57	12	a 56	70 52
Little Dog Star, <i>Procyon</i>	2	2	b 40	3	a 53	10	a 26	44 20
Cor Hydra	2	0	a 16	5	a 41	11	a 6	32 53
Cor Leonis, <i>Regulus</i>	1	0	b 51	6	a 21	13	a 33	51 38
Lion's Tail, <i>Deneb</i>	2	0	a 34	8	a 32	15	a 30	54 21
Virgin's Spike	1	4	a 24	9	a 37	14	a 50	28 31
<i>Arcturus</i>	1	2	a 33	10	a 30	18	a 27	58 59

For an Example of the Use of the above Table, let the Time of the Rising of the Great Dog Star, on *January 1*, be demanded. First, looking against the proposed Day, in the Kalendar, the Time of the Southing of the Seven Stars appears to be 8 H. 43 M. after Noon. From which subtract 1 H. 36 M. (found in the Table,) the Remainder 7 H. 7 M. is the true Time required. If you would know the Time of the Setting of the same Star, then 7 H. 38 M. must be added to 8 H. 43 M; which gives 16 H. 21 M. answering to 21 M. after 4 the next Morning.

*Note*, Every Star rises and sets about 4 Minutes earlier each Day than on the preceding Day.

NEW ÆNIGMAS to be ANSWERED in the Next Year's Diary.

I. Ænigma 363 by Sir Jacob Hopper, Knight.

THE Bards who wrote in Times of old,  
Of many strange Productions told:  
Of Broods of Harpies, and the Snake  
That took it's Rise from *Lerna Lake* :  
Of Sphinxes too, and Gorgons dire,  
And fell Chimeras breathing Fire.  
Strange Monstets ! hard to be reduc'd to  
Aught Tribe or Species we are us'd to.  
Of *Cerberus* They likewise tell,  
The triple-headed Dog of Hell ;  
With Deities enough to fright one,  
*Sylvanus, Faunus, Pan* and *Triton*,  
*Triton* the Trumpeter, an odd Fish,  
With human Face and Tail of Cod-Fish,  
Wild Mixtures ! yet you may in me  
A stranger Composition see ;  
Old *Cbiron* was half Man, half Horse,  
The *Minotaur* still something worse ;  
But view my Frame, and then judge whether  
I don't exceed them both together.  
In me you'll find what's worth your seeing  
A triple, strange, compounded Being.  
As for the Sphynx and Harpy Race,  
Like them I boast an Angel's Face ;  
But tho' endu'd with Fire and Fury,  
I'm no Chimera, I'll assure you.  
In Nature strangely I'm divided  
And tho' by Instinct chiefly guided,  
To Reason I have fair Pretence,  
And claim a double Share of Sense ;  
Yet underhand I must confess,  
Tho' more than Man, I'm something less ;  
And for the most part, needs must pass  
For little better than an Ass.  
Yet some, perhaps, would claim Alliance,  
But know I bid them all Defiance,  
And to exclude such vain Pretenders,  
I'm altogether of all Genders ;  
Both Male and Female, common too ;  
A seeming Paradox, but true.

B 2

Once

Once I was rare, but now I own  
 I'm common and familiar grown ;  
 People now view me far and near  
 Without Astonishment or Fear.  
 For we pass over and despise  
 What's obvious and before our Eyes ;  
 While what we think a rare Invention  
 Soon gains our Wonder and Attention.  
 Had I appear'd at *Troy*, my Dread  
 Must quickly through that State have spread,  
 For such a Prodigy as I am  
 Had shaken the whole Realm of *Priam* :  
 Whole Hecatombs, in many a Nation,  
 Had not suffic'd for Expiation.  
 —Frame to yourselves, the Poet begs,  
 A three back'd Monster with eight Legs,  
 Plac'd like no Animal's alive,  
 On this Side three, on th' other five.  
 Then range the World, look round all Nature  
 And say—What Prodigy is greater.

## II. Ænigma 364. by Mr. *Ralph Hulse*.

Before th' Ætherial Orbs their Dance began,  
 Or sacred Love a Council held for Man ;  
 Before the Birth of either Time or Place,  
 I reign'd despotic o'er the boundless Space :  
 But tho' I did my ancient Lot resign,  
 Half the Domain of this vast Globe is mine ;  
 To me the Stars their native Lustre owe,  
 And drowsy Mortals their Repose below.  
 Me Poets love, and subtle Statesmen prize,  
 When They would screen a Project from the Eyes ;  
 By which the *British Fair* may solve my Name,  
 And shew to what a Title I lay claim.

## III. Ænigma 365. by *Anthony Shallow Esq.*

Armed with Death insidious, I betray,  
 And Thousands perish by my ruthless Sway :  
 Prepar'd I wait to crush, in fatal Hour,  
 Th' unwary Wretch that falls within my Pow'r.  
 Yet am no Beast of Prey that thirsts for Blood ;  
 I am Man's Friend ; and like his own my Food.  
 Yet in my direful Jaws Destruction reigns,  
 And struggling Victims strive for Life in vain.  
 But these, a miscreant Race that lawless roam,  
 Spoil, waste, and ravage, wheresoe'er they come ;



To Learning Foes, curst Objects of your Spite,  
Vile, skulking, Fugitives that shun the Light:  
Yet dare profanely the chaste Fair surprize,  
With rude Attempt, unmoved by their Cries.  
Such are th' atrocious Caitifs we annoy;  
'Tis for your Sakes, *dear Ladies*, we destroy.

IV. Ænigma 366. by *Amanuensis*.

Nature the richest of her Treasures gave,  
The artful Structure of my Frame to build;  
Tho' I no proper Life or Motion have,  
Mankind to me their awful Homage yield.  
Best Part of Kings imprison'd are by me;  
To give me Piacé they gladly think it fit,  
When Rivals seek to give them Liberty  
They'll fight and die for fear of gaining it.  
The *Hands* that made me ne'er my Right possess,  
The *Hands* that gave me ne'er my *Owners* were,  
Nor they who win me hardly e'er can guess  
How dearly bought their wish'd for Conquests are.

V. Ænigma 367. by Mr D. Davis, Master of the Boarding  
School at *Burley*, in *Gloucestershire*.

Let Kings and Tyrants boast no more  
Of Vassals and Despotic Pow'r;  
By Nature's Law to me is given  
The greatest Power under Heaven:  
The proudest Monarchs I confine,  
Who silently themselves resign,  
And own Obedience (by a Nod)  
To me, more than a Demi-God.  
So universal is my Sway,  
That High and Low my Laws obey,  
Yet least of all the Industr'ous Few,  
Who oft withhold the Tribute due,  
Yet own my Pow'r and bless it too. }  
When Strife tumult'ous threatens high,  
None can appease 't so well as I.  
When Arguments successless prove }  
Nor Duty, Gratitude, nor Love  
The jarring Contest can remove,  
By softest Means (such is my Pow'r)  
I calm the Rage and Peace restore.

But tho' such Wonders I perform,  
 (To still a Tempest, lay a Storm)  
 Before Intemp'rance Footing gain'd  
 My Empire was where Darknes reign'd;  
 But now bright Sol, with blushing Ray,  
 Is Witness of my potent Sway.  
 Nay more (tho' 'tis a Shame to tell) }  
 I'm in the Temple known too well,  
 But in the Play House seldom dwell. }  
 If more of me you seek to know,  
 Enquire not of the Sons of Woe,  
 But of the Happy, and the Gay;  
 Who to me ready Homage pay;  
 Tho' while They in my Pow'r remain,  
 Shou'd you enquire, 'twill be in vain.

VI. Ænigma 368. by Mr. J. Willimott.

In Eastern Climes, where ancient *Nilus* laves  
 The neighb'ring Plains with his nutritious Waves,  
 I first appear'd on Earth, and there began  
 To execute my Vengeance upon Man;  
 Whom I oppress'd with wide-destroying Hand,  
 Nor could all earthly Help my Pow'r withstand.  
 Six Letters form my Name: But, what is strange,  
 In losing Two, I suffer little Change;  
 The difference only this,—when Six I had,  
 Where e'er my quick-destroying Hand I laid, }  
 The Mortal Wretch was well, was sick, was dead. }  
 Possess'd of only Four,—I cannot kill,  
 Yet I remain Man's sore Tormentor still.  
 But what's most strange, tho' I've two Letters less,  
 Yet I in Syllables receive Increase.  
 Let this suffice, I dare not tell you more;  
 Guess the six Letters, and you'll know the Four.

VII. Ænigma 369. by Mr. James Dowse of Fiskerton.

Who is my Sire? And what am I?  
 He ne'er was born, I never die:  
 He suffers Death, like Mortal Man;  
 From Pain secure, I still remain.  
 High in the Air I'm often seen,  
 And often on the verdant Green;  
 Still, faithful, on my Sire attend,  
 And all his Purposes befriend;  
 'Till thrust out by a younger Brother:  
 Then I'm compell'd to serve Another;

To Mankind then I yield support;  
Who greatly my Assistance court:  
Nor do their secret Thoughts conceal,  
Which I, in silence, still reveal.  
But I expose myself too bare;  
You may from hence my Name declare.

PRIZE ÆNIGMA, by Sir *Jacob Hopper*, Knight.

Unhappy me! that long before my Birth  
Lay dormant in my Tomb, for Ages lay  
Unseen, unheard of, deep envelop'd round  
In thickest Gloom and uncongenial Night.  
What others at the fatal Close of Life  
Are doom'd to undergo, I Wretch endur'd  
Long ere I saw the joyous Face of Morn.  
The Sun mean-time his annual Course perform'd,  
Seasons return'd and Nature persever'd  
Jocund in all her gay Variety:

While I in depth of Darkness lay conceal'd  
Far from the Fields of Æther, waiting still  
Some plastic Hand to bring me forth to Day.  
At last I came; and from my Prison-house,  
Cumbrous, unweildy, freed, upright I rose  
Welcom'd to Day-light by th' admiring Crowd.

But whence I gain'd my wond'rous Form and Air,  
What Art Promethean fram'd me, must remain  
For ever doubtful: Man indeed, vain Man,  
Thinks me his Offspring: Paradox most strange;  
For I existed long before my Parent,  
(If such he be)—'Tis true, Man kindly lent  
His Hand obſtetric; by his Means, releas'd,  
I rose to Day, and to Perfection came.

Lifeless I seem, yet not devoid of Passion:  
With Pride I often swell, or lowly bend  
Humble and meek, or witness deadly Woe.  
With Love I languish, or with Pity melt  
And soft Compassion, but my Looks deceive,  
And all is false and hollow; for within  
I bear a stony Heart, and cruel once  
Slew my Adorer, as he prostrate lay  
And Incense offer'd at my faithless Shrine\*.

Many there are that ape me, but in vain.  
Some of Vulcanian Frame, that menace stern  
In native Armour. Others much more mild  
Of Sylvan Race—Dryad and Hamadryad.

\* *Vide Theocrit.*

Not unlike Those, of whom the Poets sing,  
 A hardy Offspring, That in Time of old  
 Sprung from the mountain Oak or tow'ring Pine.  
 One 'mong the rest mis-shapen and deform'd,  
 Obstrep'rous too and loud, and big with Riot,  
 Void of all Fear and Rev'rence fain with me  
 Would claim Alliance: impotent of Mind,  
 And vain Presumption! but what must we not  
 Expect from him Audacious, Insolent,  
 Utterer of Libels foul, and Jest's obscene,  
 That still abuses and disturbs his Betters,  
 Nor spares the sacred Synod nor the Senate;  
 That spurns at Men and Gods, and dares affront  
 The Majesty of *Sbeba*? But to him  
 I no Relation bear; 'tho' by Man's Art  
 Abus'd, I sometimes with a Harlot's Mien  
 Naked and shameless stare in open Day,  
 And prostitute my Beauties. Mute I am,  
 Nor know the Gift of flowing Eloquence:  
 Yet want not winning and persuasive Ways  
 To captivate the Soul, and hold it fix'd  
 In pleasing Admiration. Some believe  
 That I can charm the Grave by Energy  
 And hidden Influence: hence to me they fly  
 To sooth those Sorrows, they but keep alive,  
 Misjudging thro' Affection. I alas!  
 Do but adorn Death's Triumph and enhance  
 Those very Sorrows I am sought to cure.  
 Thus by a strange Vicissitude of Fate,  
 Back I return from whence I first arose,  
 A sad Appendage to the silent Tomb.

Whoever truly answers this Ænigma before *Candlemas Day*, has a  
 Chance for 10, and another for 8 Diaries.

## NEW QUÆRIES, to be answered next Year.

### Quære I. by Solon.

What is Happiness?

### Quære II. by the same.

Whether, more People in the World are not unhappy by the Folly of  
 indulging, and brooding over gloomy, and disagreeable Ideas, and being  
 anxious about Trifles, than from any real Cause, or through the unavoid-  
 able Misfortunes of Life.

Quære

*Quære III. by T. B.*

Is a great Estate with a weak Constitution, or a vigorous State of Body with a slender Fortune, to be preferred?

*Quære IV. by Ariadne.*

Whether, the pretending Love to, and keeping Company with several Women at the same Time (so much practis'd by the Country Beaux) and thereby, wantonly, robbing an innocent, unexperienced Virgin of her Peace of Mind (and too often of her Character) has not something in it very cruel and inhuman? And, whether she, who, after knowing the true Character of such Pretenders, admits of their addresses, does not justly forfeit the good Opinion, not only of Men of Sense and Honour, but also of the prudent and virtuous Part of her own Sex?

*PRIZE QUÆRE, by Philosophicus.*

To what Height in the Air may we reasonably suppose Exhalations, raised by the Sun, do ascend, when in the most rarified State?

*Whoever answers the same before Candlemass-Day, has a Chance for 6 Diaries.*

*A REBUS. by Mr. James Robinson.*

A Thing that to Debtors oft gives much Offence,  
With one Third of a King who hath Virtues immense,  
To these add the Sign of the Vocative Case,  
Then half a Denial put in the next Place.  
These Hints rightly taken, you thence may infer,  
Where liveth, at present, your Servant,

J. R.

*NEW QUESTIONS to be ANSWERED in the next  
YEAR'S DIARY.*

*I. QUESTION 376, by Rusticus.*

**A**N honest Man a Horse did buy,  
That was both lame and poor:  
A Golden Guinea was the Price,  
And five good Shillings more.  
This Horse he fed with Corn and Hay,  
Till he seem'd wond'rous sound:  
When, meeting with another Chap,  
He sold him for three Pound.  
By which he lost half the Prime Cost,  
One fourth o'th' Keeping too.  
What did the Keeping stand him in?  
What did he lose, say you?

*II. Quæ-*



## II. QUESTION 377, by Miss Maria A—t—f—n.

There are three Cities A, B, and C, lying in the same Road; whereof the first is 136 Miles distant from the second, and the second 104 Miles distant from the third: From A to B a Courier travelled in two Days; and from B to C in two Days more, diminishing his distance every Day alike, from the first to the last. What Number of Miles did he travel each particular Day?

## III QUESTION 378, by Mr. Charles Tate.

My Wife's a Scold, a Niggard, and a Slut,  
And ev'ry Day she's sure to pay my Scott;  
And yet for What, no Mortal e'er can tell,  
Unless her Courage rise from living well:  
The which to tame, that I may live in quiet,  
I am resolv'd henceforth to stint her Diet,  
In Quantity, to what it was before,  
As  $e$  to  $a$ : which, *Gentlemen*, explore,  
From the Equations \* that you see subjoin'd:  
Else come and take my Place—If you've a Mind.

$$* \text{ Given } \begin{cases} \frac{a a + e e}{a} \times \frac{e}{a} = b = 83, 2. \\ \frac{a a - e e}{a} \times \frac{a}{e} = c = 1920. \end{cases}$$

## IV. QUESTION 379, by Mr. John Morland.

Two Persons, A and B, having an equal Claim to an Annuity of 100*£*. to continue for 30 Years, agree to share It between them in this Manner, *viz.* A for his Part is to enjoy the whole Annuity for the first ten Years; B and his Heirs being to have the entire Reversion thereof for the remaining 20 Years. The Question is, To find the Rate of Interest allow'd in this Contract, with the present Value of the Annuity corresponding.

## V. QUESTION 380, by W. T—t.

The Sum of the Squares of the two Diagonals, of any Trapezium, together with the Square of twice the Line joining their Middle Points, is equal to the Sum of the Squares of all the four Sides of the Trapezium. A Demonstration of this is required.

## VI. QUESTION 381, by Bathonius.

Two Ships sail, at the same Time, from two Ports under the same Meridian, whose Difference of Latitude is 10° 25'. That from the southernmost Port runs due East at the Rate of 4½ Miles per Hour; and That from the Northernmost, E. S. E. at the Rate of 7 Miles per Hour: I demand the Distance sail'd by each Ship, when They are at their nearest

Nearest Distance from each other, and also what that Distance will

VII. QUESTION 382, by Mr. *Tho. Moss*.

To determine the least Triangle that can be circumscribed about a given Triangle, whereof the three Sides are 8, 10, and 12 Inches.

VIII. QUESTION 383, by *Anthony Shallow*, Esq.

To draw a Right-line parallel to a given Line, which may cut three other Lines given by Position, in such Sort, that the Rectangle under the two Parts thereof, intercepted by those Lines, may be given in Magnitude.

IX. QUESTION 384, by Mr. *Tho. Moss*.

Sailing due North, at the Rate of 4 Knots, in a Current, a certain small Island bore E. N. E. from us, at the Distance of 40 Miles: After running 12 Miles (by the Log) It bore due East; and having run 16 Miles more, upon the same Course, It's Bearing was then found to be S. E. To determine, from these Observations, the Direction and Velocity of the Current.

X. QUESTION 385, by *W. T—t*.

The vertical Angle of a Triangle being  $= 70^\circ$ , and the Sum of the two including sides  $= 100$  Feet; To determine the Triangle itself, when the Perpendicular is a mean Proportional between the whole Base and one of its two Segments.

XI. QUESTION 386, by Mr. *Timothy Doodle*.

Within a rectangular Garden, containing just an Acre of Ground, I have a Circular Fountain, whose Circumference is 28, 40, 52, and 60 Yards distant from the four Angles of the Garden. From these Dimensions the Length and Breath of the Garden, and likewise the Diameter of the Fountain, are required.

XII. QUESTION 387, by Mr. *Patrick O Cavanah* of Dublin.

In the Latitude of  $51^\circ 32'$  North stand two Pillars S. W. and N. E. of one another, at the Distance of 200 Feet: The Height of the southermost Pillar is 60 Feet, and That of the Northermost 40 Feet. At what Time of the Day, on *June 20*, do the Shadows of their Summits approach the nearest to each other?

XIII. QUESTION 388, by Mr. *Timothy Doodle*.

Supposing  $p, q, r, s, t$ , &c. to represent the Tangents of any Number of Arcs  $P, Q, R, S, T$ , &c. equal, or unequal: To determine a general Expression for the Tangent of the Sum ( $P+Q+R+S+T$  &c.) of all those Arcs; the common Radius being Unity.

XIV. Que—

XIV. QUESTION 389, by Mr. E. R.—*n*.

To determine the Ratio of the Densities of the Sun and Earth, independent of the Sun's Parallax.

XV. QUESTION 390, by *Anthony Shallow*, Esq.

Having given any three computed, visible Latitudes of the Moon, in a Solar Eclipse, together with the corresponding Differences of Longitude of the Sun and Moon: To shew the Manner of finding, from thence the true Time of the greatest Obscuration, and likewise the nearest Approach of the two Centers.

PRIZE QUESTION, by *Anthony Shallow*, Esq.

To determine the Figure which the Piers (or the Starlings) of a Bridge ought to have, so that the Length, and greatest Breadth of Each, and their Distances from one another, being given, the Water in its Passage through the Bridge shall suffer the least Resistance possible.

N. B. *The Person who gives the best Solution to this Question will be intitled to a Prize of six Diaries: And whoever truly answers it, before Candlemass-Day, will have a Chance, by Lot, to win the same Number of Diaries.*

## ANSWERS to the ÆNIGMAS in the last-Year's Diaries

- I. 351. A COW-TIE.
- II. 352. FAME.
- III. 353. A PARROT.
- IV. 354. A STORM.
- V. 355. VARIETY.
- VI. 356. A PRINTER.
- VII. 357. TWELVE O'CLOCK,  
or NOON.
- VIII. 358. A CHILD'S CORAL.

- IX. 359. AN HOAR-FROST.
- X. 360. A NEWS-PAPER.
- XI. 361. THE MONTHLY REVIEW.
- XII. 362. A CAT.
- Prize FRENCH ALMANACK.
- 1. Lat. *Finab*, in the Whale's Belly.
- 2. Lat. *The Sun*.
- 3. Lat. *A Frog*.

All the Ænigma's answered by Mr. *Ralph Hulse*, in the subsequent Declaration of *Strephon's* Passion for the charming *Sylvia*.

A S charming *Sylvia* with her PARROT play'd,  
*Strephon*, a Youth, address'd the blooming Maid.  
 The heav'nly Lustre of those piercing Eyes  
 UN-TIE the Burthen of the Northern Skies!  
 Those Lips more red than choicest CORAL are,  
 Those Hands, than any Lily, soft and fair.

Tho' the pale SUN darts forth a sickly Ray	2 Lat.
And wheels round distant Orbs the feeble Day;	6
Tho' saucy PRINTERS should my Right molest,	12
And noisy CATS disturb my balmy Rest,	5
Yet full of Thee, thro' VAR'IOUS SCENES I go,	4
Fearless thro' STORMS when Winds tempest'ous blow.	11
Impatient grown, a fresh REVIEW I cast,	3 Lat.
And trace, as FROG-like Bounds, the dreary Waste;	1 Lat.
More eager still, the raging Main explore	
And Billows undisturb'd by WHALES before.	
But if to crown my Joys with fond Delight	
My <i>Sylvia's</i> Form might bless me Day and Night,	
I would not envy those bright Realms that lye	7
Beneath the Zenith of a NOON-TIDE Sky;	9
I'd range the Pole encompass'd round with FROST,	
And find a Paradise in <i>Sylvia's</i> Coast.	
Let ROYAL-ALMANACK adorn her Name,	Pr.
And Bards in PUBLICK-PAPERS sound her FAME.	ro. 2.

All the Ænigma's answer'd by *H—h Smith.*

As I one Day, by Chance, did look,	
Into the Ladies Riddling Book.	
There, first, I saw surprizing Tales	
Of STORMY Winds and mighty WHALES.	4. 1 Lat.
At next REVIEW, I did espy	11
NEWS PRINTED with VARIETY,	10. 6. 5
Of PARROTS, FROGS, and FAMOUS Knacks,	3. 3 Lat. 2
Of COW-TIES, CATS, and ALMANACKS;	1. 12. Prize
Or how the SUN, at NOON, dispells	2 Lat. 7
The FROSTY Vapours from the Hills.	9
Lastly, with CORALS, Bells, and Fiddles,	8
I end an Answer to the Riddles.	

An Answer to most of the Ænigmas, by Mr. *Sam. Bamfield*;  
inscribed to Miss *Anna Hulse.*

Happy! most happy, Miss, your rural Seat;	
However BLUSTRING FAME may charm the Great.	4. 2
How sweetly there <i>Aurora</i> spreads her Beams!	
How kindly PHOEBUS shoots his lucid Streams!	2 Lat.
How charming does the silent NOON appear!	7
How blest each Day—each Month—the circling Year!	
No SOUNDING STRINGS disturb the peaceful Night;	12
Nor CHILDISH TOYS to empty Mirth excite.	8
No LIBELLERS, no human PARROTS there!	11. 3
Nor secret Foes, like nipping FROSTS, to fear.	9
No false, disgustful NEWS disturbs your Mind,	10
But all is peaceful, honest, charming, kind.	
	Long

Long may you, Miss, these Blessings all enjoy;  
And nought your Peace, your Health, your Rest destroy.

Most of the *Ænigma's* were also answered, in Verse, by Mrs. *Eliza Gibbons*, Miss *Maria Ar—d—l*, Mr. *Ja. Dowsie*, Mr. *R. Pearson*, Mr. *William Dennis*; and lastly by Mr. *John Ramsay*, ON THE CHARACTER OF A WOMAN. But Compositions of that satirical Turn are not allowable in the *LADIES DIARY*; for which Reason some other Answers (besides that Gentleman's) are omitted, that might, for their Elegancy, have merited a place in this Collection.

### ANSWERS to the QUÆRIES in last Year's Diary.

*Quære I.* answered by *Oedipus Secundus*.

**G**audy Shews and Parade catch the Eye, Heart and Head  
That is empty, and childish and vain:  
For Like will to Like, as the Gudgeon will strike,  
If tempting's the Bait or the Train.

*Mr. Bamfield*, entering more seriously into the Subject, imputes the Partiality of the Fair-sex in Favour of the Beaux, to a Desire of Admiration. Which kind of Homage these Gentlemen, who make it their whole Study to appear agreeable, are always ready at hand to bestow: Whereas Men of Sense, however great a Regard they may have for the Beautiful Part of the Creation, find other Objects worthy of some Part of their Attention.

But Miss *G. L.* of *Plymouth*, in Answer to this *Quære*, says, "That *Master Fiso* (the Proposer) is quite mistaken; it being well known that  
"Ladies of Penetration choose Men of Sense and Merit; and leave the  
"outside Gentlemen for the superficial Ladies."

*Quære II.* answered by *Oedipus Secundus*.

Dear *Lucy* to state your nice Question aright,  
And from Numbers to choose the fittest of Use;  
(As such Purchases cheap are and common)  
Your Scold is a Scab, Sot a Sow, Drone a Drab,  
Your Jilt is a Beast, your Drunkard a Pest,  
So that bad is the best, fit for no Man.

*Hodge the Miller* (being accustomed to the Softness of a Mill) declares for the Scold; whereas *Mr. T. B.* (a Gentleman of a very peaceable Disposition) prefers the Drone; as does likewise the ingenious *Mr. J. Amburn*. Who answers *It* thus,

Of all the dark Characters here exprest,  
A Drone is no great Bane to Peace and Rest,  
Tho' bad indeed, yet still she seems the best. }



## The Woman's Almanack, 1754. 31

But Mr. *Bamfield* is clearly for the *Scold*; because she does not waste her Husband's Effects, as the *Sot*, *Drone*, and *Filt* necessarily must. A Man (adds he) may stand (though very uneasily) in the Presence of a Scold: But who can behold a rational Creature metamorphosed into a Scold? An active Being into a Stone? or a beautiful Creature openly violate the most sacred Oaths of Love and Fidelity, without great amazement, Sorrow, and Indignation?

After all, we cannot but approve of Miss *G. L.*'s Opinion, who says,

"Were I to choose for Each a Man

"Like unto Like shou'd be my Plan.

### *Quære* III. answered by *Hodge the Miller*.

It is impossible for all Men to be happy alike; although a great Many might make themselves much more happy than they are; by preserving a Serenity of Mind, and bearing those Misfortunes with Calmness and Resolution which they cannot avoid.

### *Quære* IV. answered by *Oedipus Secundus*.

Ev'ry Suit and Offence might be settled by Sense,

By Reason's and Truth's easy Rules;

But Passion and Pride are so strong on each Side

That neither will own themselves Fools.

### *Quære* V. answered by *T. B.*

To shew the Resolution and Activity of Those who have a better Share of Animal Spirits than Understanding.

### *Quære* VI. answered by Miss *G. L.*

By not throwing good Money after bad; but rather taking what They can get, and giving the Debtor his Liberty to work for more.

### *Quære* VII. answered by *Oedipus Secundus*.

An handsome fair Face is a Gift, and the Grace

Of the Sex, when They're virtuous and good.

'Tis the Heart that betrays into Thorns and By-Ways,

And makes It a Snare when They're lewd.

### *Prize Quære* answered by Miss *G. L.*

1. That all Animals may keep Society with their own Species. 2. That Men, Beasts, Birds, &c. may discern wholesome Vegetables from such as are poisonous; by their Form, Smell, &c.

To which this young Lady adds, that, 1 *Cor.* xv. ver. 38. answers the whole in every Respect better than it can be answered any other Way.

ANSWERS

ANSWERS to the QUESTIONS in the last Part  
Diary.

I. QUESTION 361, answered by Mr. J. M.

The Spaces pass'd through by falling Bodies being as the Squares of the acquired Velocities, the Velocity of the Water falling 8 Feet is to its Velocity acquired in falling 6 Feet, as  $\sqrt{8}$  to  $\sqrt{6}$ . Therefore by the Property of the Leaver, the Force of the same Water to turn a Wheel of 16 Feet, with a Fall of 8 Feet, is to its Force to turn a Wheel of 18 Feet, with a Fall of 6 Feet, as  $16\sqrt{8}$  to  $18\sqrt{6}$ , or as  $8\sqrt{4}$  to  $9\sqrt{3}$ ; that is, as  $\sqrt{256}$  to  $\sqrt{243}$ . Whence, it is evident that the Wheel of 16 Feet Diameter has the greater Advantage.

It was answered in like Manner, and on the very same Principles, by several other Contributors: But these Principles, though true in themselves, do not appear to us sufficient to give a right and full Determination of the Problem under Consideration. To have the true Quantity of the Effect, not only the Height of the Fall, and the Diameter of the Wheel, but also the Weight and Force of the Water in the Wheel ought to be regarded; and consequently the different Positions of the Buckets with Respect to the Horizon. As this is a Subject of much Importance, it is hoped our ingenious Correspondents will think it worthy of a farther Consideration, and communicate their Thoughts thereon, for the Benefit of the Publick, in our next Diary; to which we shall refer for a fuller Discussion of this Matter.

II. QUESTION 362. answered by Mr. Timothy Doodle.

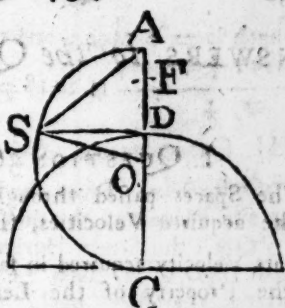
Let CD be the Earth's Semi-Diameter, and DA the required Height from whence the Ball must fall: Then  $3 : 4 :: CD^2 : CA^2$ ; and consequently  $CA = CD \times \sqrt{\frac{4}{3}} = 3980 \sqrt{\frac{4}{3}} = 4596$  Miles. Whence DA is given  $= 616$  Miles, or  $3252480$  Feet.

Now the Distance descended in the first Second of Time being as the Force, it will here be  $= \frac{3}{4}$  of  $16 \frac{1}{2}$  Feet  $= 12 \frac{1}{6}$  Feet: And consequently the Time of Descent through AD, with the same Force

uniformly continued,  $= \sqrt{\frac{3252480}{12 \frac{1}{6}}} = 519$  Seconds. But, supposing a

Semi-circle ASC to be described upon AC, and DS perpendicular to AC, the true Time of Descent through AD will be in Proportion to 519 Seconds, the Time just now found, as half the Sum of the Sine DS and the Arch AS is to the Chord AS (as is proved by the Writers on Fluxions.) Now  $AC : CD :: \sqrt{4} : \sqrt{3} :: 4 : 3$

the Radius of the Tables) :  $\sqrt{3} =$   
 $=$  the Verfed-Sine of the Angle  
 $C = 137^{\circ}.4'$ . Whose Supplement  
 $S$  is therefore given  $= 42^{\circ}.56'$ : The  
 Sine of which will be .6311, and  
 Measure of the Angle itself  $= .7494$ ;  
 half-Sum of These is .7152: But the  
 Sine of  $42^{\circ}.56'$  ( $2 \times \text{Sine } 21^{\circ}.28'$ ) is  
 .7319: Hence it will be .7319 : .7152 ::  
 507 Seconds; or 8 Min. 27 Sec. the  
 Time required.



The same answered by Anthony Shallow, Esq;

Let the Earth's Semidiameter (CD) be denoted by  $a$ , it is plain that

$\sqrt{\frac{a}{3}} - a$  will express the required Height AD from which the  
 Ball must fall. To determine therefore the Time of the Descent  
 AD, let the Velocity of the Ball, per Second, acquired in falling  
 any Distance AF ( $=x$ ), be denoted by  $v$ ; putting  $c = AC$ , and  
 $\frac{3}{2} \times 16.1 =$  the Distance descended in the first Second of Time  
 A: Then,  $2d$  being the Measure of the Velocity acquired in  
 Second, with the Force at A, it will be, as  $c - x^2 : c^2 :: 2d :$

$\frac{c}{x^2}$ , the Velocity generated, per Second, by the Force at F.

Therefore  $v : \frac{2dc}{c-x^2} :: x : \dot{v}$ ; and consequently  $\frac{v\dot{v}}{2d} = \frac{c\dot{c}\dot{x}}{c-x^2}$ .

Now, by taking the Fluent,  $\frac{vv}{4d} = \frac{cc}{c-x} - c = \frac{cx}{c-x}$ . There-

fore  $v = 2\sqrt{dc} \times \frac{x^{\frac{1}{2}}}{\sqrt{c-x}}$ , and consequently  $\frac{\dot{x}}{v} = \frac{\dot{x}\sqrt{c-x}}{2\sqrt{cd} \times x^{\frac{1}{2}}}$ .

Therefore  $\frac{1}{\sqrt{cd}} \times \frac{c\dot{x} - x\dot{x}}{\sqrt{cx - x^2}} =$  the Fluxion of the required Time.

Now the Fluent is  $= \frac{1}{4} \sqrt{\frac{c}{d}}$  multiplied by the Sum of the Sine and

whereof the corresponding Verfed-Sine is  $\frac{2x}{c}$  (Unity being the

Radius). But  $\sqrt{\frac{c}{d}}$  (expressing the Time of Descent thro' AC, with  
 uniform Force equal to that at D) is given  $= 1418$  Seconds. And  
 is  $= 0.26795$ ; answering to an Arch of  $42^{\circ}.56'$ ; whose

C

Length

Length is  $= 0.7494$ ; and that of its Sine  $= 0.6811$ . Hence we have  
 $0.6811 \div 0.7494 \times 1418 = 507 \text{ Seconds} = 8 \text{ Min. } 27 \text{ Sec.}$  W.W.

### III. QUESTION 363 answered by Mr. Richard Gibbon.

**Construction.** From the Latitude of the Place and the Sun's Declination, the Sun's Horizontal Azimuth  $BDC$  is given  $= 48^\circ. 35'$ . Having therefore made the Angle  $BDC = 48^\circ. 35'$ , and  $DB = 3$ ; let a Square whole Side  $AC$  is 10, be formed, and let the Angle thereof  $ACB$  be so moved along the Line  $D \odot$ , that the End  $A$ , of the Side  $CA$ , may, at the same Time, pass over the Line  $BDA$ , till the other Side of the Square passes thro' the given Point  $B$ . In which Position draw  $BC$  and  $AC$ , and the Thing is done, as is evident by Inspection.



**Algebraic Solution.** Put  $b = AC = 10$ ,  $c = BD = 3$ , and  $x =$   
 Sine of  $BDC =$  Sine  $ADC$ ; also put  $d = \frac{c}{b} = 0.074992$ , and  $x =$

Sine of  $ACD$ : Then is  $\sqrt{1 - xx} =$  Sine  $BCD$ ; and we have  
 $b : :: x : dx = AD$ ; also  $\sqrt{1 - xx} : c :: s : \sqrt{1 - xx} = BC$

And, by 47 E. 1.  $b^2 + \frac{c^2 s^2}{1 - xx} = c^2 + 2cdx + d^2 x^2$ . Reduced  
 $x = 0.5517 =$  the Sine of  $33^\circ. 29'$ . From whence  $CD = 3.47$   
 Miles.

*The same answered by Anthony Shallow, Esq;*

Suppose the Circumference of a Circle to pass thro'  $A, D$ , and cutting  $BC$  produced in  $E$ . Then,  $AE$  being drawn, in the Triangle  $ACE$  will be given (besides the Right-Angle) the Side  $AC$  and the Angle  $E = BDC = 48^\circ. 34'$  the Sun's Horizontal Azimuth from the North: Whence  $CE$  is given  $= 8.8265$ ; which put  $= a$  making  $AC = b$ ,  $BD = c$ , and  $BC = x$ ; Therefore  $AB = \sqrt{bb + xx}$ ; and, by the Property of the Circle,  $c \sqrt{bb + xx} = x \times x + a$ . Hence  $x = 2.6966$ ; and consequently  $DC = 3.47$   
 Miles.

It was also answered, in a curious Manner, by Mr. J. Adams, Mr. Sam. Bampfield, Bathonius, Mr. W. Bevil, Mr. T. Cornish, Mr. J. Hollingworth, Mr. J. Milbourn, Mr. B. Tulbor, and Mr. J. Wigglesworth.

V. QUESTION 364 answered by Mr. John Wigglesworth.

LET P represent the North Pole, Z the Zenith, ZS the Shadow of the Stick, and ZT the Direction of the Cloud; then the Angle TZ  $\odot$  =  $60^{\circ}$ ; and, in the oblique Spheric Triangle  $\odot$  ZP, is given Z the Complement of Latitude, P  $\odot$  the Complement of the Sun's Declination, with the contained Angle P; whence the Angle  $\odot$  ZR is found =  $42^{\circ}.30'$ ; which added to TZ  $\odot$ , gives TZR =  $99^{\circ}.42'.30''$ . Therefore the Wind blew from W. b. N.



N. nearly. Again, by allowing 70 Pulsations to a Minute, the Shade of the Cloud will move over a Space = 88 Yards in the Time of 10 Pulsations, or  $8\frac{4}{7}$  Seconds; which is at the Rate of 21 Miles per Hour.

The same answered by Mr. James Robinson.

During 10 Pulsations, we may suppose the Sun does not sensibly change its Place; and, considering the immense Distance of the Sun, when compared with that of a Cloud, we may take the Rays proceeding from the Sun to the Cloud, at both Observations, to be parallel: Then, the Sun's Azimuth being (per Spherics)  $9^{\circ}.26'$  from the South, the Direction of the Cloud was E. b. S.  $\frac{3}{4}$  S. *ferè*; and the hourly Velocity of the Wind, blowing from the opposite Point, 21 Miles. W. W. R.

Mr. Ash, Batbonius, Mr. W. Bevil, Mr. T. Coates, Mr. Richard Gibbons, and some Others, also answered this Problem, and agree, exactly, in the Velocity of the Cloud; but make some little Difference in its Direction, arising from having taken the Sun's Declination from different Authors

V. QUESTION 365 answered by Mr. J. Milbourn.

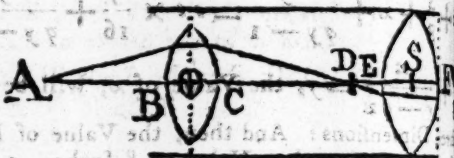
LET 100 £. Principal =  $a$ , and for the required Principal, &c. put  $x$ ; then  $a : x :: x : \frac{x^2}{a}$ , the Interest for one Year; and as (Year) is to  $x$  (Years) so is  $\frac{x^2}{a} : \frac{x^3}{a}$ , the Interest for  $x$  Years: Whence (per Quest.)  $\frac{x^3}{a} = \frac{x}{2}$ ; reduced,  $x = \sqrt{\frac{a}{2}} = 7.07106$  Pounds = 7l 11s. 5d.

In the very same Manner it was answered by Mr. J. Ash, Mr. S. Bamfield, Mr. G. Dickinson, Mr. J. Gelling, Mr. Gibbons, Mr. Hollingworth, Mr. Jonah Milford, Mr. W. Newman, Mr. Jos. Peil, Mr. D. Roberts, Mr. James Robinson, and Mr. Ch. Tate.



## VI. QUESTION 366 answered by Κυβερνήτης.

LET the Radius of the Convexity of the Lens O, next the Object A, be put  $= a$ , its Thickness  $BC = b$ , the Radius of the Eye-Glass  $S = \alpha$ , and its Thickness  $EF = \beta$ ; and let the Sine of Incidence be to that of Refraction, out of Air into Glass, as  $1$  to  $r$ ; putting  $q = 1 - r$ ,  $r =$  the given Index of Amplification, and  $x =$  the Distance  $CD$  of the Place of the Image from the Lens O.



Then, A being the Place of the Image of an Object at D, by a known Theorem in Optics,  $AB$  will be equal to  $\frac{r a \mathcal{Q}}{q \mathcal{Q} - a}$ ;  $\mathcal{Q}$  being put  $= b + \frac{x}{r - \frac{a}{q}}$ . And, by another known Theorem (which is

a Corollary to the former) the principal Focal Distance  $ED$  of the Lens  $S$ , will be  $\frac{r \alpha}{q} \times \frac{a - q \beta}{2a - q \beta}$ .

But, by the Question,  $b = \frac{3a}{8}$ ,  $\beta = \frac{3\alpha}{8}$ , and  $\alpha = \frac{10a}{3}$ . Therefore,

by the Substitution of equal Values,  $\mathcal{Q} = \frac{3a}{8} + \frac{x}{r - \frac{a}{q}}$ , and  $DE =$

$\frac{10ra}{3q} \times \frac{1 - \frac{3}{8}q}{2 - \frac{3}{8}q} = a \times \frac{10r}{3q} \times \frac{8 - 3q}{16 - 3q}$ . Whence  $DS (= DE$

$+ ES) = a \times \frac{10r}{3q} \times \frac{8 - 3q}{16 - 3q} + \frac{5a}{8} = ca$ , by putting  $c = \frac{10r}{3q}$

$\frac{8 - 3q}{16 - 3q} + \frac{5}{8}$ . Again, by the Question,  $\frac{OD}{OA} \times \frac{FA}{SD} = r$ ; that

is, in Species,  $\frac{x + \frac{3a}{16}}{\frac{ra\mathcal{Q}}{q\mathcal{Q} - 1} + \frac{3a}{16}} \times \frac{ca + x + \frac{3a}{8} + \frac{ra\mathcal{Q}}{q\mathcal{Q} - a}}{ca} = r$ .

Put  $\frac{x}{a} = z$ , and  $\frac{3}{8} + \frac{z}{r - \frac{1}{q}} = y$ ; then will  $\mathcal{Q} (= \frac{3a}{8} + \frac{ax}{r - \frac{1}{q}})$

$= ay$ ; and our Equation, by Substitution, &c. will be reduced to  $\frac{z + \frac{3}{16}}{\frac{ry}{qy - 1} + \frac{3}{16}} \times \frac{c + \frac{3}{8} + z + \frac{ry}{qy - 1}}{c} = r$ ; or,  $z + \frac{3}{16}$

$$+ \frac{3}{8} + z + \frac{r y}{q y - 1} = e t \times \frac{3}{16} + \frac{r y}{q y - 1}. \text{ From whence, and}$$

$$+ \frac{z}{r - q z} = y, \text{ the Value of } z, \text{ will be found by an Equation of}$$

three Dimensions: And then, the Value of F A being given in Terms of  $a$ , by putting that Value = 8 Inches,  $a$  itself will be found, and from thence every Thing else, required.

But as the finding of  $z$  this Way (the Terms being numerous) will be somewhat troublesome, the known Method of Approximation, Trial and Error, may be here used with Advantage. According to

which, having assumed for the Value of  $z$ , That of  $y$  ( $= \frac{3}{8} + \frac{r y}{r - q z}$ )

will be immediately found; and then, by substituting these two Values in the other Equation, the Error will be determined, &c. &c.

VII. QUESTION 367 answered by Mr. W. T—t.

LET P be the Pole of the World, Z the Zenith of the Place, and B, I, C, the three Stars: From the given Longitudes and Latitudes of which, or from their Right Ascensions and Declinations, the Distances P I and I C, and the Angle B I C, may be found, by common Trigonometry.



Assume the Value of Z I as near as you can to its true Value: Then, having two Sides and one Angle, in each of the Triangles P I Z, C I Z, the Angles B I Z and C I Z

may be found, and consequently their Sum B I C. Mark how much this Value of B I C differs from the given Value of the same Angle:

Then make a second Assumption for Z I; and find, again, the Value of the Angle B I C, marking the Error, as before. From these two Errors a new Value of I Z, by the known Methods of Approximation,

may be found; and so on, till you arrive to what Degree of Exactness you please. Having thus determined Z I and Z I C, from the latter of

these deduct P I C, the Remainder gives the Angle Z I P: From which, and the two given Sides including it, both Z P and Z P I will

become known.

VIII. QUESTION 368 answered by Mr. J. Robinson.

LET 999999 =  $a$  be the constant Factor, in order to produce six 1's, six 2's, &c. The other Factor call  $x$ , and the first Product  $p$ ; then  $x a = p$ , and consequently  $x = \frac{p}{a}$ .

Universally, putting the constant Factor (which is arbitrary) for the Denominator, and the given Product for the Numerator, the Fraction,

or Fractions, thence arising will be the variable Factor, or Factors, required.

If any Number of 9's be taken for the Denominator of a Fraction, and the same Number of any of the Digits for a Numerator, the Fraction, when reduced to a Decimal one, will have the very same Figures as the Numerator, repeated to Infinity. Thus, for Example,

$\frac{3234}{9999}$  is = ,1234123412341234, &c. ad infinitum. Thus also,

$\frac{44444}{999999}$  = ,44444, &c. and consequently  $999999 \times ,4444$ , &c.

= 444444; and so of Others. The variable Factors, derived by this General Method, are Fractions; but there are particular Answers to be

had in whole Numbers. Thus, because  $\frac{111111}{3} = 37037$ , and

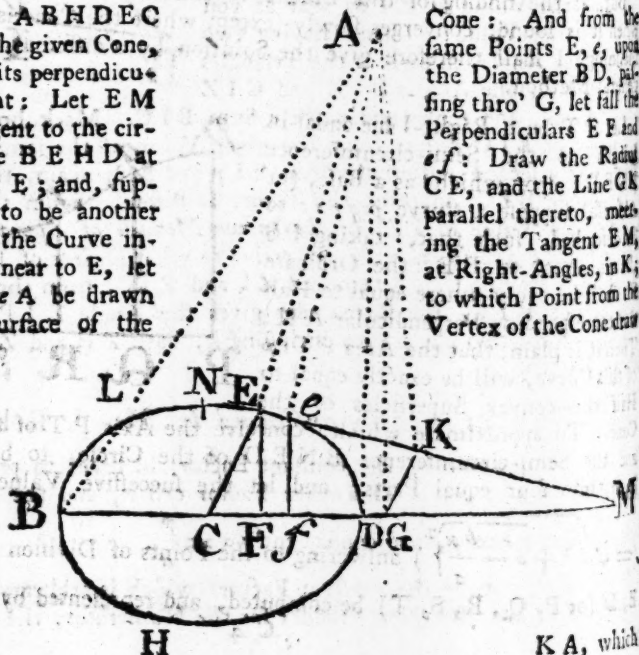
$\frac{31111111}{3} = 37037037$ , it is evident that, if 3 be taken for the

constant Factor, the respective variable Factors, to produce six, and nine 1's, will be 37037, and 37037037. The Multiples of which by 2, 3, 4, 5, &c. will consequently be the other variable Factors required. In like Manner, 37 being assumed for the constant Factor, the variable Ones will be 3003 and 3003003, together with their Multiples.

### IX. QUESTION 369 answered by Κυβερνήτης.

**L**ET ABHDEC be the given Cone, and A G its perpendicular Height; Let EM be a Tangent to the circular Base BEHD at any Point E; and, supposing *e* to be another Point in the Curve indefinitely near to E, let EA and *e*A be drawn in the Surface of the

Cone: And from the same Points E, *e*, upon the Diameter BD, passing thro' G, let fall the Perpendiculars EF and *e*f: Draw the Radius CE, and the Line GK parallel thereto, meeting the Tangent EM, at Right-Angles, in K; to which Point from the Vertex of the Cone draw



KA, which

A, which will be perpendicular to the Tangent EM; because (being  
 al to  $\sqrt{AG^2 + GK^2}$ ) it will be the least possible, in this  
 position, where GK is the least possible.

Put now  $CE = a$ ,  $CG = b$ ,  $AG = c$ , and  $CF = x$ ,  $BE = z$ ,  
 and  $EM = z$ . Then, by the Property of the Circle,  $CM = \frac{a}{x}$ : And,

by similar Triangles,  $CM : CE :: MG (\frac{a}{x} - b) : GK = a - \frac{bx}{x}$ .

Thence  $AK (= \sqrt{AG^2 + GK^2}) = \sqrt{c^2 + a^2 - 2bx + \frac{bbxx}{a}}$ .

Which, multiplied by  $\frac{1}{2}z$ , gives  $\frac{1}{2}z \sqrt{cc + aa - 2bx + \frac{bbxx}{a}}$ .

for the Area of the Triangle EAc, or the Fluxion of the required

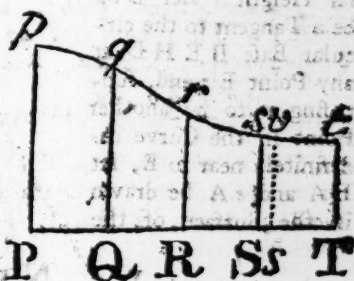
superficies. Which Fluxion, because  $z = \frac{ax}{\sqrt{aa - xx}}$ , is also =

$\frac{ax \sqrt{cc + aa - 2bx + \frac{bbxx}{a}}}{\sqrt{aa - xx}}$ : Whose Fluent will express the

required Superficies of the Cone.

But, as the finding of this Fluent is extremely troublesome, and,  
 when it is found, converges slowly (except where the Cone is but little  
 inclining) I shall therefore give the Solution by a different, and more  
 general Method.

Let PT be a Right-line equal in  
 length to the Semi-circumference  
 BNED; upon which, as a Base, (or  
 Abscissa) suppose a Curve pqrst to  
 be described, such that, taking PS  
 always equal to BE, the Ordinate  
 St shall be every-where equal to Half  
 the corresponding Perpendicular AK:  
 Then it is plain, that the Area PTtφ  
 of this Curve, will be exactly equal to  
 Half the convex Superficies of the  
 Cone. To approximate which, conceive the Axis PT of the Curve,  
 and the Semi-circumference BNED of the Circle, to be divided,  
 each, into four equal Parts; and let the successive Values of AK



$(= \sqrt{c^2 + a - \frac{bx}{a}})^2$  answering to the Points of Division B, L, N,

E, D (or P, Q, R, S, T) be computed, and represented by  $d, e, f, g$ ,  
 and

and  $b$ , respectively. Then, these Values, being the Doubles of the corresponding Ordinates  $Pp$ ,  $Qq$ ,  $Rr$ ,  $Ss$ ,  $Tt$ , it is evident, by the

Method of Equi-distant Ordinates, that  $\frac{7 \times d + b + 32 \times e + g + i}{90}$

$\times \frac{1}{2} PT$ , will express the Area of the Curve, or Half the Superficies of the Cone, very nearly.

Now, in the Case proposed,  $AB$  being  $= 12$ ,  $AD = 9$ , and  $BD = 6$ , we have  $CE = 3 = a$ ;  $DG (= \frac{AB^2 - AD^2 - BD^2}{2BD}) =$

$\frac{2}{3}$ ;  $CG = 5\frac{1}{3} = b$ ; and  $AG^2 = 75.9375 = c^2$ . Here, therefore

$d (= AB) = 12$ ;  $e (= \sqrt{cc + aa + \frac{1}{2}bb + ab\sqrt{2}}) = 10.999$

$f (= \sqrt{cc + aa}) = 9.2162$ ;  $g (= \sqrt{cc + aa + \frac{1}{2}bb - ab\sqrt{2}}) =$

$8.7432$ ; and  $b (= AD) = 9$ . From whence  $(\frac{7 \times d + b + 32 \times e + g + i}{90})$

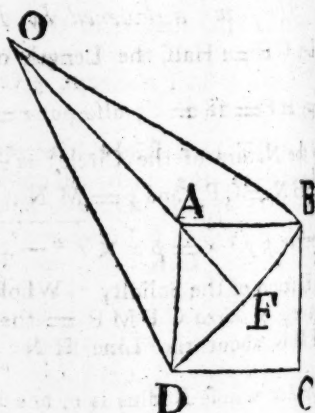
$\times AED$  the Content of the whole, required, Superficies comes out  $93.13$  square Inches. By taking a greater Number of Ordinates, the Answer may be brought out to any Degree of Exactness desired, however great the Inclination may be.

Mr. Bamfield, by an easy Approximation, brings out nearly the same Numbers with the above.

X. QUESTION 370 answered  
by Mr. J. Robinson.

LET  $a = OD = OB = 78$ ,  
 $b = OA = 59.161$ , and  $x$   
 $= AF$ . Then (per Eu. 47. 1.)  
 $bb + 2bx + 2xx = aa$ . Reduced,  
 $x = \sqrt{\frac{aa - bb}{2}} - \frac{b}{2}$ : From whence

the Side of the Square will be found  
 $= 24$  Poles, and the Area of the  
Field 3 Acres, 2 Roods, and 16  
Perches.



The same answered by Master John Birks, a Tyro at  
Gosberton School.

The three visible Corners of the Field being represented by  $A$ ,  $B$ , and  $D$ , it is evident, because the given Distances of the two last from the Oak, at  $O$ , are equal, that the line  $OAF$  bisects the Angle  $BAD$ , and consequently that the Angle  $BAO = 135^\circ$ . From which, and the given Sides  $AO$  and  $BO$ , the Angle  $ABO$  is found (by Trigonometry)





## XII. QUESTION 372 answered by Mr. Timothy Doolittle

LET  $O$  and  $C$  be the Centers of the Earth and Moon, and  $H$  the Place required. Suppose  $HF$  and  $HB$  to touch the two Surfaces in  $F$  and  $B$ , and let  $FGf$  and  $BDb$  be perpendicular to  $QC$ .

Put  $a = OE = 3985$ ,  $b = CE = 1085$ ,  $c = OC = 245070$ , and  $x = OH$ ; and let  $p = 2 \times 3.14159$ , &c. So shall the Circumference  $FEf$ , &c.  $= pa$ , and the Circumference  $BAb$ , &c.  $= pb$ : And therefore the Parts  $FEf$ ,  $BAb$  of the two Surfaces visible to an Eye at  $H$ , are equal to  $pa \times EG$  and  $pb \times AD$ , respectively.

But, by similar Triangles,  $OH(x) : OF(a) :: OF(a) : OG = \frac{aa}{x}$ : Whence

$EG = a - \frac{aa}{x}$ : And, in the very same

Manner,  $AD = b - \frac{bb}{c-x}$ . Therefore, by Substitution,  $FEf$

$+ BAb = pa \times a - \frac{aa}{x} + pb \times b - \frac{bb}{c-x}$ : Which, being

Maximum,  $\frac{a^3}{x} + \frac{b^3}{c-x}$  must be a Minimum; and its Fluxion

$\frac{a^3 x}{x^2} + \frac{b^3 x}{(c-x)^2} = 0$ . Hence  $\frac{x^2}{a^3} = \frac{(c-x)^2}{b^3}$ ; or  $\left(\frac{b}{a}\right)^3 \times x = c - x$

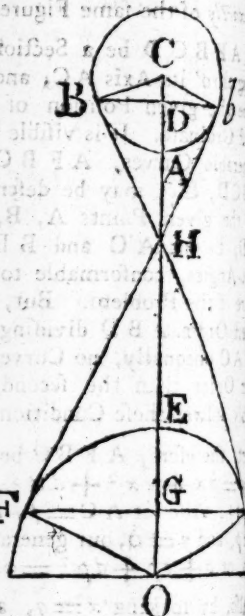
and consequently  $x = \frac{c}{1 + \left(\frac{b}{a}\right)^3} = 214585$ . Therefore the Place where

Friend Bevil must take his View is 210600 Miles above the Surface of the Earth, if He can find his Way up so high.

Mr. Alb, Mr. Wigglesworth, and Mr. Bevil the Proposer, (proceeding upon the same Principles) bring out the same Conclusion.

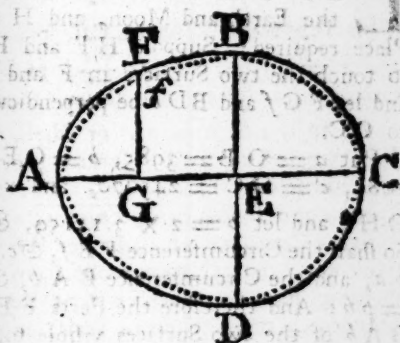
## XIII. QUESTION 373 answered by Anth. Shallow, Esq.

THIS Question, in the Form it is proposed, is indeterminate. The Figure of the Egg, as well as its principal Dimensions ought to have been given; since, of an Infinity of Curves that may be described thro' the same, given, Points, Experience is not sufficient



It is which to choose; it not being known that ever two Eggs exactly of the same Figure.

Let  $AFBCD$  be a Section of an Egg thro' its Axis  $AC$ , and let  $BD$  be the given Position of the perpendicular Ordinate. It is visible that several Curves,  $AFBCD$ ,  $AGCD$ , &c. may be described thro' the given Points  $A, B, C, D$ , to cut  $AC$  and  $BD$  at right Angles, conformable to the Nature of the Problem. But, the Ordinate  $BD$  dividing the Axis  $AC$  unequally, no Curve of a higher Order than the second can answer these Conditions.



Let, therefore,  $AFBC$  be a Curve of this Order, whose Equation  $y = bx + cx^2 + dx^3$  (being the most simple the *Data* will admit): Also let  $AC = p$ ,  $AE = q$ ,  $BE = r$ : Then, by making  $x = p$ , and  $y = 0$ , our general Equation becomes  $bp + cp^2 + dp^3 = 0$ , or  $b + cp + dp^2 = 0$ .

So, by making  $x = q$ , and  $y = r$ , we have  $bq + cq^2 + dq^3 = r$ , or  $b + cq + dq^2 = \frac{r^2}{q}$ .

Lastly, by making  $b\dot{x} + 2cx\dot{x} + 3dx^2\dot{x}$  (the Fluxion of  $bx + cx^2 + dx^3$ )  $= 0$ , and writing  $q$  in the Room of  $x$ , we have  $b + 2cq + dq^2 = 0$ .

Now, from the three Equations thus derived,  $d$  is found  $= \frac{2q - p}{q^2 \times p - q^2}$ ;  $c = \frac{rr \times 3qq - pp}{q^2 \times p - q^2}$ ; and  $b = \frac{rrpq \times 2p - 3q}{q^2 \times p - q^2}$ .

Therefore the general Equation, in known Terms, is  $yy = \frac{rr}{q^2 \times p - q^2}$ .

$p - 3q \times pqx + 3qq - pp \times xx - 2q - p \times x^3$ . Whence,

be put  $= 3.14159$ , &c. we get  $\pi y y^{\frac{1}{2}} = \frac{rr}{q^2 \times p - q^2} \times$

$- 3q \times pqx + 3qq - pp \times x^2x - 2q - p \times x^3x$  for the

Equation of the Solidity: Whole Fluent, when  $x = p$ , will be found

$\pi r^2 p^3 \times 6pq - 6qq - pp$ , expressing the true Content of the

Solid. Which therefore is to  $(\pi rrp)$  That of the circumscribing

Cylinder,

Cylinder, in the Proportion of  $\frac{p^2 \times 6pq - 6qq - pp}{12q^2 \times p - q^2}$  to the

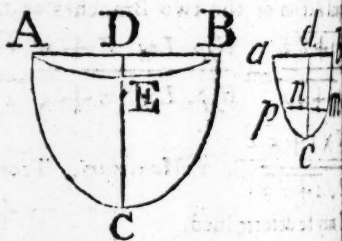
This Proportion, in the Case proposed, (where  $p = 2\frac{1}{2}$ ,  $q = 1$  and  $r = \frac{3}{4}$ ) becomes as  $\frac{275}{432}$  to Unity. Therefore the Solidity according to the above Assumption) comes out 2.8124 Cubic Inches.

As to the Superficies, or Shell of the Egg, it may be also found from the same general Equation; but it is hoped the facetious Proposer will himself determine that, and accept it as a proper Reward for his Trouble and Industry in promoting useful Science.

Some Correspondents consider the Egg as formed of two unequal Spheroids; but this does not seem to agree well with the true Figure, it being hard to conceive that the Curvature should be immediately changed by more than one Half, in passing from one Side of the great Ordinate to the other.

#### XIV. QUESTION 374 answered by Mr. W. Bevil.

Let  $acb$  be a Curve similar to That ( $ACB$ ) formed by the Chain, such that its Ray of Curvature ( $a$ ) at the lowest Point  $c$  may  $= 1$ . Then, the Area of the Semi-curvilinear Space,  $acd$ , will be truly defined by  $y\sqrt{1+zz} - z$ , (as is proved by the Writers on Fluxions);  $z$



being  $= ca$ , and  $y (= ad) = \text{Hyp. Log. } z + \sqrt{1+zz}$ .

Hence, putting the Length of the Chain  $= c$ , we have (by the general Property of similar Figures) as  $z+y$  to  $\frac{1}{4}cc$  as  $(AC+AD)$  to

$$:: y\sqrt{1+zz} - z : \frac{1}{4}cc \times y\sqrt{1+zz} - z = \text{Area } ACD$$

Which being a Maximum, let its Fluxion be therefore taken and made  $= 0$ ; whence, after proper Reduction, there will come out

$$\frac{1}{2}y \times z \times z + y = y\sqrt{1+zz} - z$$

From which Equation (by the known Methods of Approximation) the Values of  $z$  and  $y$  may be found. For, having assumed for  $z$ ,  $y$  will be given from the Equation  $y =$

$\text{Hyp. Log. } z + \sqrt{1+zz}$ ; and then, by substituting these Values of  $z$  and  $y$  in the above Equation, the Error will be known; and thence, by repeating the Operation, &c. the true Value of  $z$ , which comes out  $= 5.452$ ; and  $y = 2.399$ . Then  $7.861$  ( $ac + ad$ )





Solidity of the Hoof  $D n A m$ ; therefore  $\frac{2 - c b^3}{2} + \frac{c a^3 x^3}{2}$

Solidity of the remaining Water, which let  $= q x^3 - p$ ;  
(per Stone)  $C a : \text{Sine of } K a :: q x^3 - p : w$ ; or,  
is the same Thing, (because the Triangles are similar)

$$\left( \frac{10 a^2 - 16 a x^2 + 10 x^4}{2} \right)^{\frac{1}{2}} : m n \left( \frac{n a - n x^2}{2} \right) :: q x^3 - p$$

$$= \frac{n a - n x^2 \times q x^3 - p}{10 a^2 - 16 a x^2 + 10 x^4}^{\frac{1}{2}}, \text{ the Tension, a Max. and confers}$$

$$\frac{a - x^2 \times q x^3 - p}{a^2 - 1.6 a x^2 + x^4}^{\frac{1}{2}}, \text{ thrown into Fluxions and properly re}$$

gives  $x^2 = 13.6$ , *feré*. Hence the Weight required  $= 24.705$

$P C = 201.57$ .

*The same answered by Mr. Patrick O'Cavanah.*

Put  $a = 15 =$  the Depth of the Frustum,  $b = 20$  the  
Diameter  $A D$ ,  $c = 10 =$  the least Diameter  $E F$ ,  $p = 7854$   
[ $2 a m$ ]  $= x$ . Then, supposing  $m n$  perpendicular to  $D A$ , it

$$b - c : b - x :: a :: a \times \frac{b - x}{b - c} = m n : \text{Whence, by a well-}$$

Theorem for the Content of a Conical Ungula, the Solidity of  $A$

$$= \frac{\frac{1}{3} p a b \times b b - x \sqrt{b x}}{b - c}. \text{ Which, subtracted from } \frac{1}{3} p$$

$b b + b c + c c$ , the Content of the whole Frustum  $A F E D$ ,

$$\frac{\frac{1}{3} p c}{b - c} \times b x \sqrt{b x} - c^3 \text{ for the Part } A F E m, \text{ in which the}$$

is contained. Now the Tension of the Rope, or the Force of  
Weight  $W$ , acting at Right-Angles to  $C a$ , so as to sustain  
Water in this Position, is known to be in Proportion to the  
of the Water in the Vessel, as the Sine of the Angle  $C P$   
( $D A m$ ) to the Radius; that is, as  $m n$  to  $A m$ , or, in Species, as

$$\frac{b - x}{b - c} \text{ to } \sqrt{\frac{a^2 \times b - x^2}{b - c^2} + \frac{b + x^2}{4}}. \text{ Whence, by the Que}$$

$$\frac{b - x \times b x \sqrt{b x - c^3}}{\sqrt{a^2 \times b - x^2 + \frac{1}{4} \times b - c^2 \times b + x^2}} \text{ (which is in a}$$

Ratio to  $A F E m \times \frac{m n}{A m}$ ) must be a *Minimum*. This Expression

Let  $yy = bx$ ,  $d = \frac{b-c}{2}$ , and  $f = \frac{aa-dd}{aa+dd} \times 2bb$ , and dividing

Denominator by  $\sqrt{aa+dd}$ , is reduced to  $\frac{bb-yy \times yyy - ccc}{\sqrt{b^4 - f^2 y^2 + y^4}}$ .

which, in Fluxions, &c. gives  $\frac{3y}{y^3 - c^3} - \frac{2}{bb - yy} + \frac{ff - 2yy}{b^4 - f^2 y^2 + y^4}$

Hence  $y = 16.516$ ,  $x = 13.7578$ ,  $CP = 262.66$ , and  $W =$

99 Pounds. Remark. As the taking of the Fluxions of Expressions compounded That in the preceding Solution, is somewhat troublesome, the following Method may, in such Cases, be of Use.

Seeing  $\frac{y^3 - c^3 \times b^2 - y^2}{\sqrt{b^4 - f^2 y^2 + y^4}}$  is to be a *Maximum*, by the Question,

Logarithm thereof, or its Equal,  $\text{Log. } y^3 - c^3 + \text{Log. } b^2 - y^2$

$\text{Log. } b^4 - f^2 y^2 + y^4$ , must also be a *Maximum*, and con-

sequently its Fluxion  $\frac{3y^2 \dot{y}}{y^3 - c^3} - \frac{2y \dot{y}}{bb - yy} + \frac{ffyy - 2y^3 \dot{y}}{b^4 - f^2 y^2 + y^4}$

Whence, dividing by  $y \dot{y}$ , we have  $\frac{3y}{y^3 - c^3} - \frac{2}{bb - yy} +$

$\frac{ff - 2y^2}{b^4 - f^2 y^2 + y^4} = 0$ , the same as before. Which Equation

is in a much better Form, for a Solution, than That immediately resulting from the common Method. In like Sort, supposing

$\frac{1}{-x^2} \times \frac{1}{b^3 + x^3} \times \frac{1}{c^4 - x^4}$  was to be a *Maximum*,

$\frac{a - x^2 \times a^2 + 2dx + x^2}{\text{Minimum}}$ , we should have  $\frac{1}{2} \text{Log. } a^2 - x^2 + \frac{1}{3} \text{Log. } b^3 + x^3$

$\text{Log. } c^4 - x^4 - 2 \text{Log. } a - x - \text{Log. } a^2 + 2dx + x^2$

or *Min.* And consequently  $\frac{x}{a^2 - x^2} + \frac{x^2}{b^3 + x^3} - \frac{x^3}{c^4 - x^4}$

$\frac{2}{a - x} - \frac{2d + 2x}{a^2 + 2dx + x^2} = 0$ . And so of the Others.

The last Year's PARADOXES answered.

PARADOX I. answered by Mr. R. Pearson.

LET Cottam tell his Lord, he must

L Dwell underneath the North Pole just

Then, let him visit Age, or Youth,

His Course he'll surely steer full South.

PARA-

PARADOX II. answered by Hodge the Miller.

THE Man had his Son and Daughter by two several Women; and the Estate was settled on the Daughter's Mother and her Heirs.

Mr. J. Moreland answers them both the same Way: To whom we are obliged for the Hints communicated; but it is not to our Purpose to regard what is printed in other Places; besides, this Gentleman was under a Mistake, in supposing the Author of the Solutions (on which are remarks) to be the same Person with the Author of a Book of Fables of the same Name.

*Who won the PRIZES, &c.*

WE received only two true Answers to the Prize-Enigma, before Candlemas-Day; the one from Mr. John Ramlay, of Morpeth; the other from Mr. James Dewse, of Fiskerton: Who are therefore intitled, each of them, to a Prize of eight Diaries (without the Chance of drawing Lots.) The six Diaries, for the Solution of the Prize-Quære, were won by Miss G. L. of Plymouth. But, to the Prize-Question, we did not receive one true Solution, (nor indeed any Attempt towards a Solution, except one) within the Time prescribed.

This unusual Backwardness and seeming Deficiency in the Contributors we are not at a Loss to ascribe to its true Cause, being sensible that the most unjustifiable Methods have been indefatigably pursued, in order to baulk, and, if possible, to utterly extirpate the Ladies Diary; and this, in a great Measure, from a Motive of Revenge, by a Person, whose irregular Behaviour and wanton Licentiousness had justly drawn upon himself the Check and Resentment of superior Power.

It is not without Concern that we likewise perceive, that several Names which, once, did Honour to this Diary, are now no more to be seen in the Number of Contributors. Whatsoever Reasons of Disaffection those Gentlemen might have, it is humbly presumed those Reasons are, now, no longer subsisting. The present Compiler, whatever his Abilities may be in Science, hopes to make it appear, by his Conduct, that *he means well*, and is equally free from *Partiality* and *Ill-Nature*. He is not (as has been maliciously given out, and advertised in several publick Papers) an Enemy, but a Friend to the Cause of the Widow of the former Compiler, Mr. Beighton; which cannot be said of that virulent Detractor, who durst, without her Consent or Knowledge, make Use of her Name, in order to abuse her *real Friends*, and to get all the Diary-Letters into his Hands, at the same Time when he was designing the utter Ruin of the *Diary*; for which, by the Favour of the Stationer's Company, she still continues to receive the same Annuity, or Stipend, as was paid to Mr. Beighton himself, for compiling the *Work*.

Some valuable Letters, this Year, did not arrive 'till after the *Diary*-Copy was delivered in; amongst which, one from Mr. Hartley, of Yarum, merits particular Notice; wherein the greater Part of the Solutions are no ways inferior to Those printed in the preceding *Work*.

*Errata.* In the Solution to Quære 2, L. 2, for *of* read *for*; and in Page 17, L. 9 and 10, for *May* read *June*.